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PCT

ENTRADA EN FASE NACIONAL

18 dic. 2007

1) SOLICITUD DE:



Patente de invención



Patente de Modelo de Utilidad



Capítulo I.



Capítulo II.

2) SOLICITANTE
(71)

Nombre: LoJack Operating
Company, LP

Dirección: 200 Lowder Brook Drive
Westwood, MA 02090 Estados
Unidos

Nacionalidad o domicilio:
Westwood, MA, Estados Unidos

Lugar de constitución:
Massachussets, Estados Unidos

IDENTIFICACIÓN

C.C. ☐

NIT: ☐

C.E. ☐

OTRO ☐

NÚMERO

Cual

Teléfono:

Fax:

E. Mail:

3) REPRESENTANTE
O APODERADO

Nombre: DILIA MARÍA RODRÍGUEZ
D'ALEMAN

Dirección: Carrera 11 N°. 86-53 Piso 6
Bogotá D.C.

Teléfono: 6181088 Fax: 6350824

E. Mail: info@clarkemodet.com.co

IDENTIFICACIÓN

C.C. ☒

NIT: ☐

C.E. ☐

OTRO ☐

NÚMERO: 41.654.882

TP: 20824 CSJ

4) INVENTOR (ES)
(72)

Nombre: VER LISTA ADJUNTA

Dirección:

Nacionalidad o Domicilio:

5) PCT (86)

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6) Título (54) UNIDAD DE UBICACIÓN DE VEHÍCULOS CON SUBSISTEMA Y
MÉTODO DE PRUEBA DE VIDA

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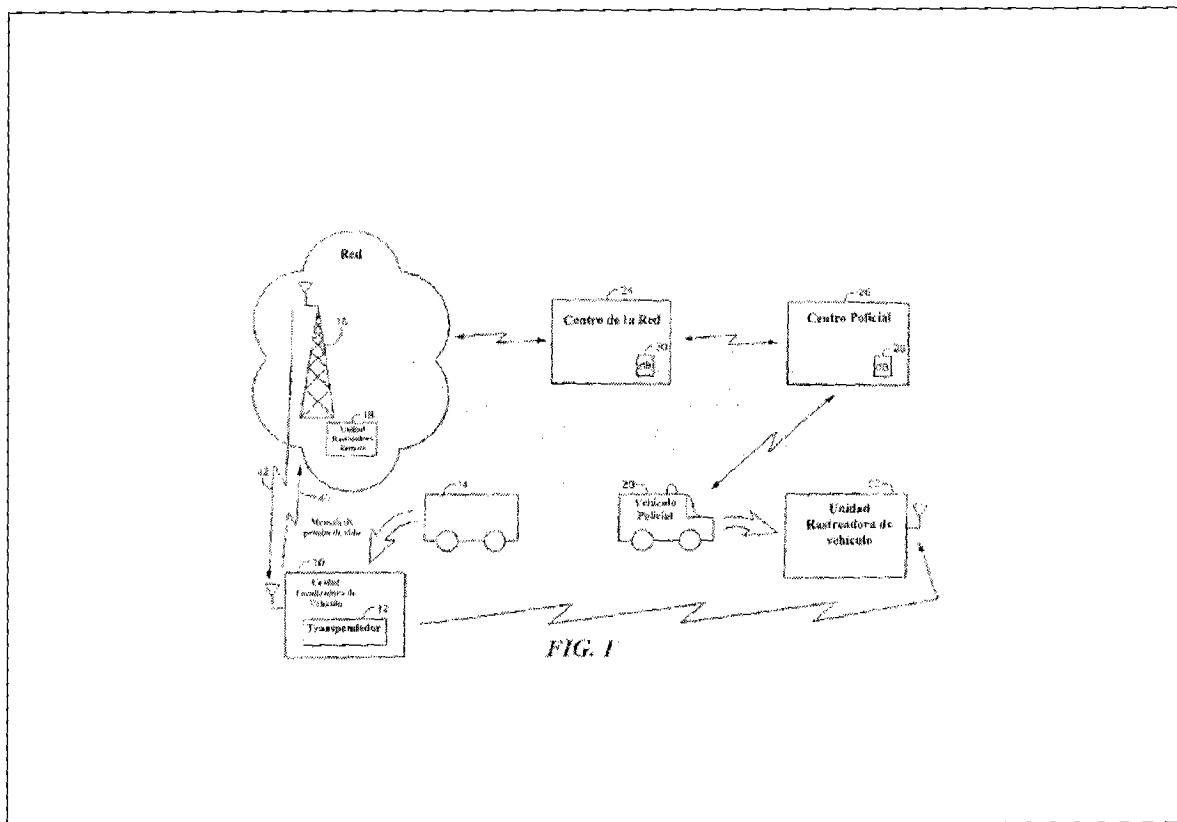
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10)

ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud
- ☐ Comprobante de pago por reivindicación de prioridad
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona Jurídica
- ☐ Poderes, si fuera el caso
- ☐ Documento de cesión del inventor al solicitante o a su causante
- ☐ Declaraciones
- ☒ Copia de la solicitud Internacional. (Resumen, descripción, reivindicación, Dibujos).
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicación, Dibujos)
- ☐ Copia del examen preliminar efectuado por la IPEA
- ☐ De ser el caso, copia del contrato de acceso
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas
- ☐ De ser el caso, certificado de depósito del material biológico
- ☐ Arte final 12 x 12 y 6 x 6 cm
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionados parcial o totalmente con la invención de esta solicitud.
- ☒ Otros:
 1. Reporte internacional de búsqueda
 2. Documentos informe de búsqueda
 3. Modificación inventor
 4. IB306

11) FIGURA CARACTERÍSTICA:



12) Solicitud concesión de la patente,

NOMBRE: DILIA RODRIGUEZ D'ALEMAN

FIRMA:

C.C. 41.654.882 de Bogota TP 20824 CSJ

Instrucciones para el diligenciamiento del presente formulario. Ver reverso de esta pagina

INVENTORES

Frank Romano,

Domiciliado en 6 Jasper Street Westborough, MA 01581 (US)

Sampath Krishna,

Domiciliado en 115 Main Street Winchester, MA 01890 (US)

Son Nguyen,

Domiciliado en 44 Pembroke Street Marlborough, MA 01752 (US)

Jesse Rhodes,

Domiciliado en 291 Prospect Street, Franklin; MA 02038 (US)

Phillip Grahame Crewe,

Domiciliado en 3 Granta Vale Linton, Cambridgeshire CB1 6LB (GB)

Daniel Johnathan Finchley Cletheroe,

Domiciliado en Flat 4 Granthams Court, De Freville Road
Great Shelford, Cambridge GB2 5LH (GB)

Mark Marsden

Domiciliado 38 Lambert Cross
Saffron Waldon, Essex CB10 2DP (GB)

Steven Walter Greendale

Domiciliado 15 Bosworth Road
Cambridge CB1 8RG (GB)

Nigel James Watson

Domiciliado 14 Mill Lane
Whittlesford, Cambridge CB2 4NE (GB)

Ian Christopher Stroud

Domiciliado "Knotty Oak", Frambury Land
Newport, Essex CB11 3PY (GB)

Gerard Edward Smith

Domiciliado 21 Standrums
Great Dummow, Essex CM6 1TY (GB)

Timothy David Howe

Domiciliado 76 Birch Trees Road Great Shelford
Cambridgeshire CB2 5AW (GB)

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

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CLARKE NODET Y CO. COLOMBIA	CONSIGNACION	BANCO POPULAR	050-00110-6	71030061	23/10/2007	26,261,000.00

**** CONCEPTO ****

CANT.	CONCEPTO	TOTAL CONCEPTO
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1	TRAMITES DE SOL. DE PATENTE DE IN	482,000.00
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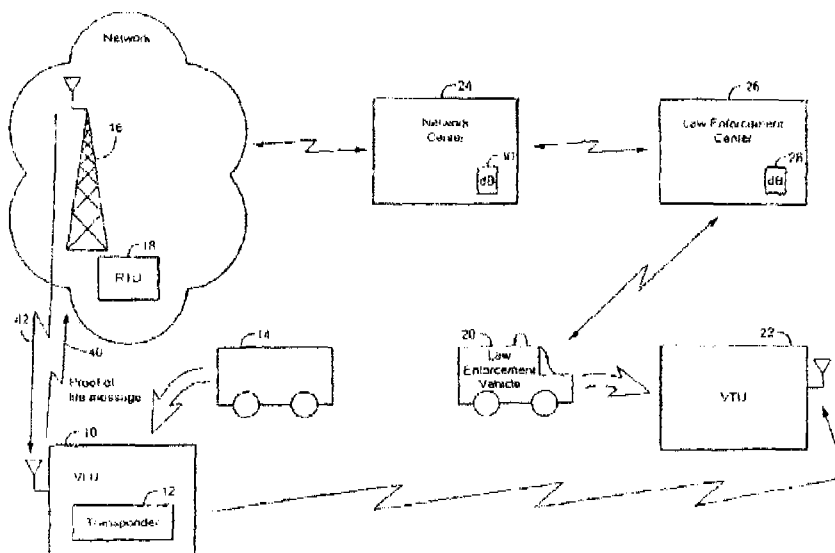
(30) Priority Data:
11/131,848 18 May 2005 (18.05.2005) US(71) Applicant (for all designated States except US): LO-
JACK OPERATING COMPANY LP [US/US]; 200
Lowder Brook Drive, Westwood, MA 02090 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ROMANO,
Frank [US/US]; 6 Jasper Street, Westborough, MA
01581 (US) KRISHNA, Sampath [US/US]; 115 Main
Street, Winchester, MA 01890 (US) NGUYEN, Son
[US/US]; 44 Pantlroke Street, Marlborough, MA 01752
(US) RHODES, Jesse [US/US]; 291 Prospect Street,
Franklin, MA 02038 (US) CREWE, Philip, Grahame[GB/GB]; 5 Granta Vale, Linton, Cambridgeshire CB1
6LB (GB) CLETHEROE, Daniel, Jonathan, Finchley
[GB/GB]; Flat 4 Granthams Court, De Freville Road, Great
Shelford, Cambridge CB2 5LH (GB) MARSDEN, Mark
[GB/GB]; 38 Lambert Cross, Saffron Walden, Essex CB10
2DP (GB) GREENDALE, Steven, Walter [GB/GB]; 15
Bosworth Road, Cambridge CB1 8RG (GB) WATSON,
Nigel, James [GB/GB]; 14 Mill Lane, Whittlesford, Cam-
bridgeshire CB2 4NE (GB) STROUD, Ian, Christopher
[GB/GB]; "Knotty Oak", Frambury Lane, Newport, Essex
CB11 3PY (GB) HOWE, Timothy, David [GB/GB];
76 Birch Trees Road, Great Shelford, Cambridgeshire
CB2 5AW (GB) SMITH, Gerard, Edward [GB/GB]; 21
Standrams, Great Dunmow, Essex CM6 1TY (GB)(74) Agents: SHANSKE, Jason, D. et al.; landiorio & Teska,
260 Bear Hill Road, Waltham, MA 02451-1018 (US).(81) Designated States (unless otherwise indicated, for every
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(54) Title: VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD



(57) Abstract: A vehicle locating unit features a receiver which receives a signal from a network of communication sources and a transponder activated when a communication source sends a message to the receiver. There is a transmitter for sending signals to the communication sources and a proof of life subsystem configured to periodically send a proof of life message via the transmitter to the communication sources.



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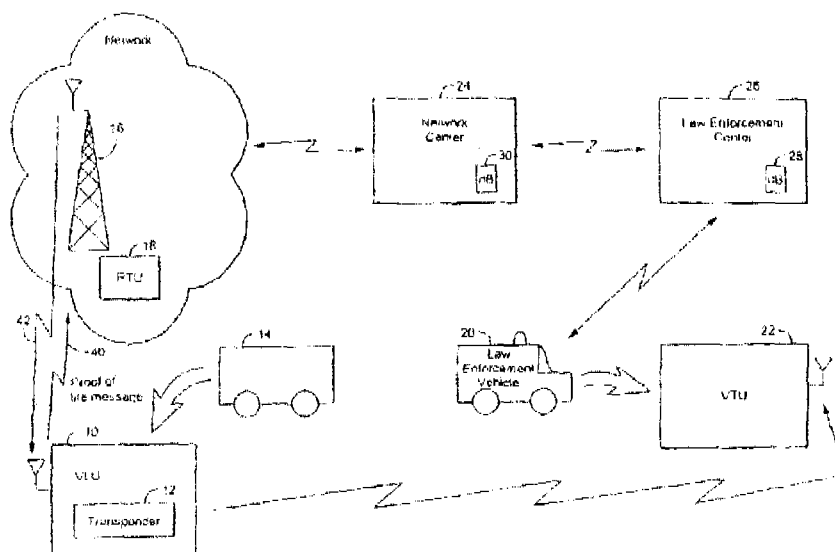
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(54) Title: VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD



(57) Abstract: A vehicle locating unit features a receiver which receives a signal from a network of communication sources and a transponder activated when a communication source sends a message to the receiver. There is a transmitter for sending signals to the communication sources and a proof of life subsystem configured to periodically send a proof of life message via the transmitter to the communication sources.

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European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
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VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD

FIELD OF THE INVENTION

This invention relates to stolen vehicle recovery systems and in particular a vehicle locating unit proof of life messaging subsystem and method.

BACKGROUND OF THE INVENTION

The applicant's successful and popular vehicle recovery system sold under the trademark LoJack® includes a small electronic vehicle locating unit (VLU) with a transponder hidden within a vehicle, a private network of communication towers each with a remote transmitting unit (RTU), one or more law enforcement vehicles equipped with a vehicle tracking unit (VTU), and a network center with a database of customers who have purchased a VLU. The network center interfaces with the National Criminal Information Center. The entries of that database comprise the VIN number of the customer's vehicle and an identification code assigned to the customer's VLU.

When a LoJack® product customer reports that her vehicle has been stolen, the VIN number of the vehicle is reported to a law enforcement center for entry into a database of stolen vehicles. The network center includes software that interfaces with the database of the law enforcement center to compare the VIN number of the stolen vehicle with the database of the network center which includes VIN numbers corresponding to VLU identification codes. When there is a match between a VIN number of a stolen vehicle and a VLU identification code, as would be the case when the stolen vehicle is equipped with a VLU, and when the center has acknowledged the



vehicle has been stolen, the network center communicates with the RTUs of the various communication towers (currently there are 130 nationwide) and each tower transmits a message to activate the transponder of the particular VLU bearing the identification code.

The transponder of the VLU in the stolen vehicle is thus activated and begins transmitting the unique VLU identification code. The VTU of any law enforcement vehicles proximate the stolen vehicle receive this VLU transponder code and, based on signal strength and directional information, the appropriate law enforcement vehicle can take active steps to recover the stolen vehicle. See, for example, US Patent Nos. 4,177,466; 4,818,988; 4,908,609; 5,704,008; 5,917,423; 6,229,988; 6,522,698; and 6,665,613 all incorporated herein by this reference.

If, however, a component of the VLU fails, it may not receive messages from the communication towers of a network and/or may fail to transmit its unique VLU identification code for receipt by one or more vehicle tracking units.

Presently, vehicle locating units are not configured to transmit messages to the network communication towers. Thus, there is no present way of detecting if a VLU has failed in the field so it can be serviced.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide a vehicle locating unit with uplink capability.

It is a further object of this invention to provide such a vehicle locating unit which can be identified as failed and serviced when needed.

It is a further object of this invention to provide a method of servicing failed



vehicle locating units in the field.

The subject invention results from the realization that if the vehicle locating unit is equipped with the transmitter for sending signals to the network or other communication sources, the vehicle locating unit itself can periodically send a "proof of life" message via the transmitter to the communication sources. If the appropriate message is not received as expected from a vehicle locating unit, that vehicle locating unit can be identified, located, and serviced as appropriate.

The subject invention, however, in other embodiments, need not achieve all these objectives and the claims hereof should not be limited to structures or methods capable of achieving these objectives.

This invention features a vehicle locating unit with proof of life functionality. A receiver receives a signal from a network of communication sources and a transponder is activated when a communication source sends a message to the receiver. A transmitter is included for sending signals to the communication sources, and a proof of life subsystem is configured to periodically send a proof of life message via the transmitter to the communication sources.

Typically, the proof of life message includes a unique vehicle locating unit identification code and the identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle. Preferably, a signal strength determining subsystem determines the communication source with the strongest signal transmitted to the receiver.

A method of servicing failed vehicle locating units in accordance with the subject invention includes the steps of configuring the vehicle locating unit to periodically send a message to one or more communication sources, logging said

message in a database, and servicing the vehicle locating unit if said message is not received. Typically, the message includes a unique vehicle locating unit identification code and an identification code of a communication source transmitting the strongest signal to the vehicle locating unit to approximate the position of the vehicle locating unit.

One method of operating a vehicle locating unit in accordance with the subject invention includes the steps of receiving signals from a network of communication sources, and activating a transponder when a communication source sends a message to vehicle locating unit. A proof of life message is periodically sent to the communication sources so the vehicle locating unit can be serviced when it is detected no proof of life message has been received as expected.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages will occur to those skilled in the art from the following description of a preferred embodiment and the accompanying drawings, in which:

Fig. 1 is a schematic block diagram showing the primary components associated with an example of a stolen vehicle recovery system in accordance with the subject invention;

Fig. 2 is a block diagram showing the primary components associate with an embodiment of a vehicle locating unit in accordance with the subject invention; and

Fig. 3 is a block diagram depicting the primary steps associated with the programming of the microcontroller shown in Fig. 2 according to one embodiment of the subject invention.



DISCLOSURE OF THE PREFERRED EMBODIMENT

Aside from the preferred embodiment or embodiments disclosed below, this invention is capable of other embodiments and of being practiced or being carried out in various ways. Thus, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of components set forth in the following description or illustrated in the drawings. If only one embodiment is described herein, the claims hereof are not to be limited to that embodiment. Moreover, the claims hereof are not to be read restrictively unless there is clear and convincing evidence manifesting a certain exclusion, restriction, or disclaimer.

As discussed in the background section above, the applicant's successful and popular vehicle recovery system sold under the trademark LoJack[®] includes a small electronic vehicle locating unit (VLU) 10, Fig. 1 with a transponder 12 hidden within a vehicle 14, a private network of communication towers 16 each with a remote transmitting unit (RTU) 18, one or more law enforcement vehicles 20 equipped with a vehicle tracking unit (VTU) 22, and network center 24.

When a LoJack[®] product customer reports that her vehicle has been stolen, the VIN number of the vehicle is reported to law enforcement center 26 for entry into database 28 of stolen vehicles. Network center 24 includes software that interfaces with database 28 of law enforcement center 26 to compare the VIN number of the stolen vehicle with database 30 of network center 24 which includes VIN numbers corresponding to VLU identification codes. When there is a match between a VIN number of a stolen vehicle and a VLU identification code, as would be the case when stolen vehicle 14 is equipped with VLU 10, network center 24 communicates with the



RTUs 18 of the various communication towers 16 and each tower transmits a message to activate transponder 12 of VLU 10 bearing the particular identification code.

Transponder 12 of VLU 10 in stolen vehicle 14, once activated, begins transmitting a unique VLU identification code. VTU 22 of law enforcement vehicle 20 proximate stolen vehicle 14 receives this VLU transponder code and, based on signal strength and directional information, the appropriate law enforcement vehicle can take active steps to recover stolen vehicle 14.

In accordance with the subject invention, VLU 10 is configured to periodically send a proof of life message as shown at 40 to a network communication tower 16 of the communication network in addition to receiving messages from network 42 in the case of a theft of vehicle 14 in which case transponder 12 is activated. The proof of life message 40 is periodically sent by VLU 10 and typically includes the identity of the VLU unit and the identification code of tower 16 having the greatest signal strength. This message is conveyed by RTU 18 to network center 24 and stored in database 30. Appropriate software at center 24 polls database 30 periodically and if any VLU unit is found not to have transmitted a proof of life message as expected, an alarm message can be generated and the customer's VLU can be serviced. By storing with the last proof of life message the identity of the tower most proximate vehicle 14, the approximate last known location of vehicle 14 can be determined in order to better service VLU 10.

VLU 10, in one example, is shown in more detail in Fig. 2 where transceiver 50 includes both message reception and message transmission functionality. Any signal received by transceiver 50 is analyzed for signal strength by signal strength monitoring subsystem 52 which may be a demodulator associated with transceiver 50.

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Thus, transceiver 50 outputs to microcontroller 54 a signal indicative of any message received by transceiver 50 and also the strength of the signal(s) received by transceiver 50. If the message received by controller 54 is indicative of a theft event, controller 54 signals transponder 12 which is then activated to transmit a signal which can be detected by VTU 22, Fig. 1 of law enforcement vehicle 20.

Controller 54, Fig. 2, however, in accordance with this invention is also programmed to include a proof of life subsystem which periodically forwards a signal on line 56 to transceiver 50 causing transceiver 50 to transmit proof of life message 40, Fig. 1 including the identification code of VLU 10 and the identification code of the network tower previously or currently transmitting the strongest signal to transceiver 50. In one embodiment, controller 54 is a Texas Instrument model MSP 430 with its own EE prom memory for storing these two identification codes. In the same embodiment, controller 54 includes its own internal clock for timing the periodicity of the transmission of the proof of life message. The periodicity of the proof of life signal can be programmable and may occur every day, every week, or even at longer intervals.

Thus, controller 54, Fig. 2 is programmed to count, step 60, Fig. 3 until the predetermined proof of life period is reached, step 62 and then ascertain the identification code of VLU 10 and the identification code of the network tower with the strongest signal from memory 64, step 66. Controller 54 then packages this data and signals, step 68 transceiver 50, Fig. 2 to transmit the proof of life message via antenna 51 to the network, Fig. 1 whereupon RTU 18 forwards the proof of life message to center 24 to be stored in database 30 for periodic analysis and polling as explained above.



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In other examples, the proof of life message is sent to network towers outside of the private network, for example, by equipping VLU 10, Fig. 1 with a cellular telephone transmitter to transmit the proof of life message via a cellular telephone network.

Thus, although specific features of the invention are shown in some drawings and not in others, this is for convenience only as each feature may be combined with any or all of the other features in accordance with the invention. The words "including", "comprising", "having", and "with" as used herein are to be interpreted broadly and comprehensively and are not limited to any physical interconnection. Moreover, any embodiments disclosed in the subject application are not to be taken as the only possible embodiments. Other embodiments will occur to those skilled in the art and are within the following claims.

In addition, any amendment presented during the prosecution of the patent application for this patent is not a disclaimer of any claim element presented in the application as filed: those skilled in the art cannot reasonably be expected to draft a claim that would literally encompass all possible equivalents, many equivalents will be unforeseeable at the time of the amendment and are beyond a fair interpretation of what is to be surrendered (if anything), the rationale underlying the amendment may bear no more than a tangential relation to many equivalents, and/or there are many other reasons the applicant can not be expected to describe certain insubstantial substitutes for any claim element amended.

What is claimed is:

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CLAIMS

1. A vehicle locating unit with proof of life functionality comprising:
a receiver which receives a signal from a network of communication sources;
a transponder activated when a communication source sends a message to the receiver;
a transmitter for sending signals; and
a proof of life subsystem configured to periodically send a proof of life message via the transmitter.
2. The vehicle locating unit of claim 1 in which the proof of life message includes a unique vehicle locating unit identification code.
3. The vehicle locating unit of claim 2 in which the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle.
4. The vehicle locating unit of claim 3 further including a signal strength determining subsystem for determining the communication source with the strongest signal transmitted to the receiver.
5. The vehicle locating unit of claim 1 in which the transmitter transmits the proof of life message to the network of communication sources.

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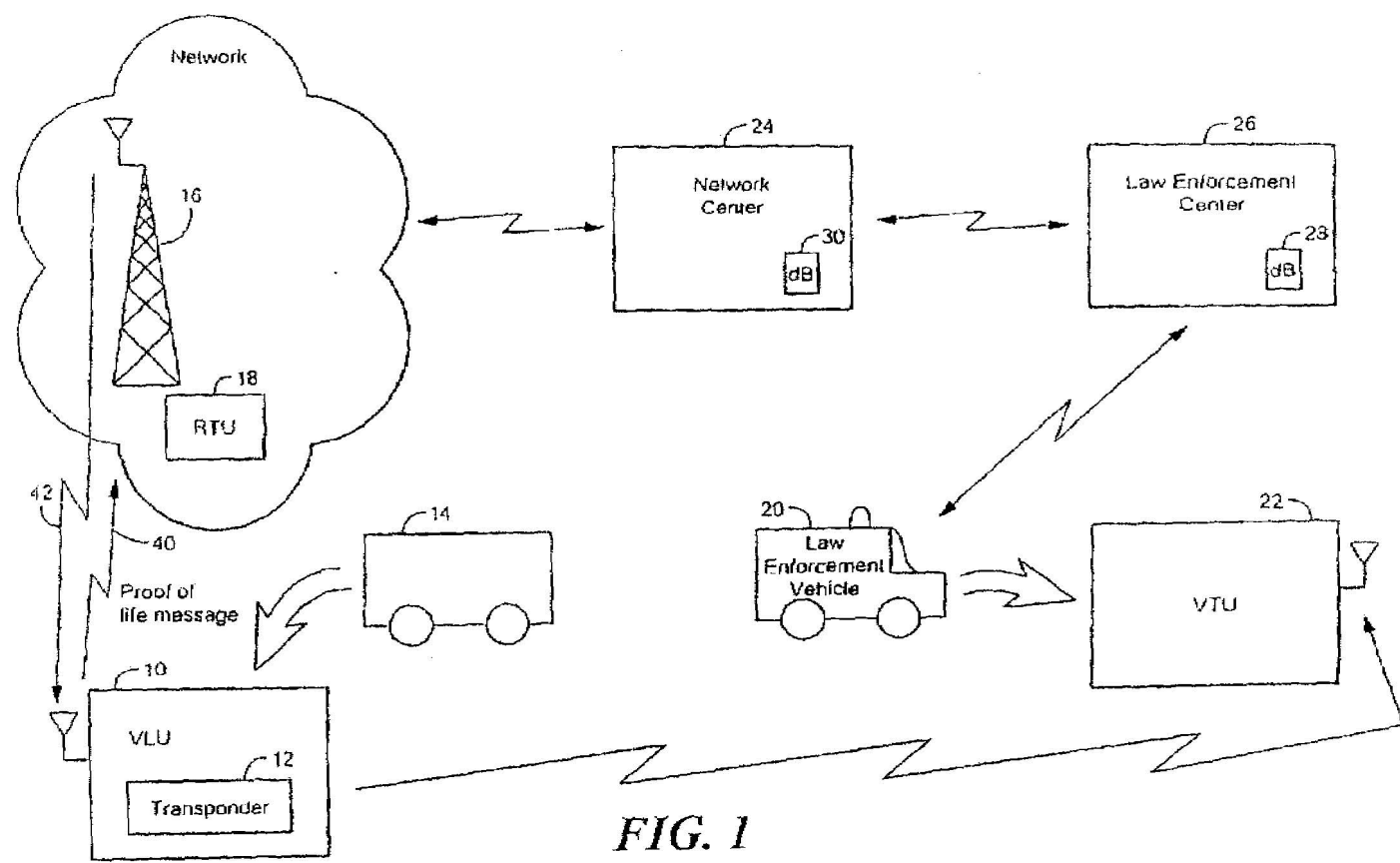


6. A method of servicing failed vehicle locating units, the method comprising:
- configuring the vehicle locating unit to periodically send a message to one or more communication sources;
 - logging said message in a database; and
 - servicing said vehicle locating unit if said message is not received.
7. The method of claim 6 in which the message includes a unique vehicle locating unit identification code and an identification code of a communication source transmitting the strongest signal to the vehicle locating unit to approximate the position of the vehicle locating unit.
8. A method of operating a vehicle locating unit, the method comprising:
- receiving signals from a network of communication sources;
 - activating a transponder when a communication source sends a message to vehicle locating unit; and
 - periodically sending a proof of life message to the communication sources.
9. The method of claim 8 in which the proof of life message includes a unique vehicle locating unit identification code.
10. The method of claim 9 in which the proof of life message further includes an identification code of a communication source transmitting the strongest

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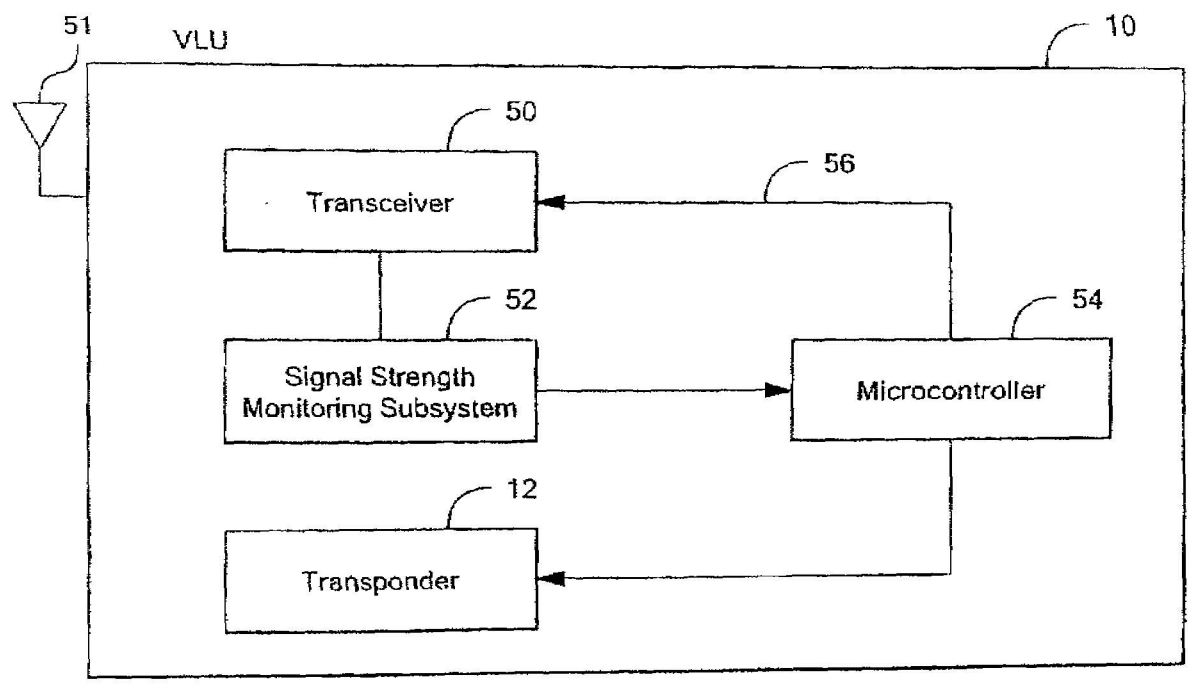
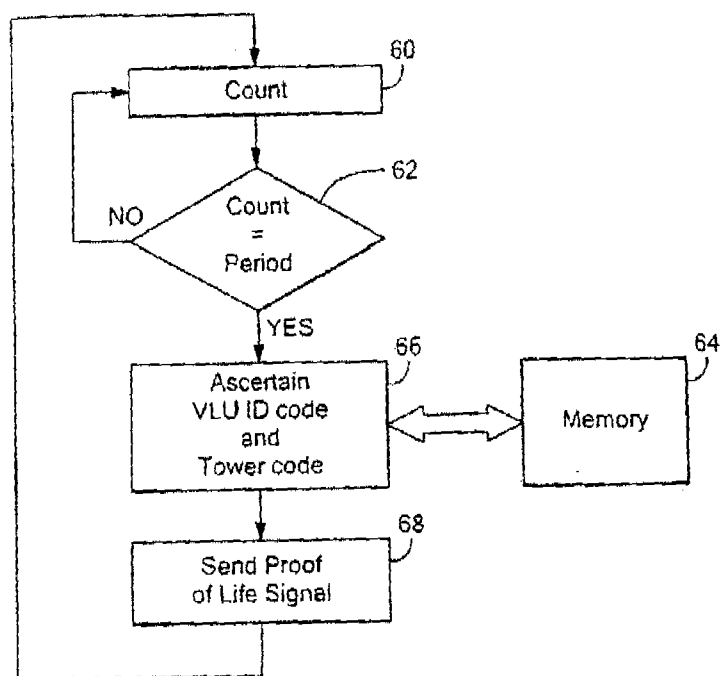


FIG. 2

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*FIG. 3*

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UNIDAD LOCALIZADORA DE VEHICULOS CON SUBSISTEMA Y
METODO DE PRUEBA DE VIDA

Resumen

Una unidad localizadora de vehículos se caracteriza por un receptor que recibe una señal desde una red de fuentes de comunicación y un transpondedor activado cuando una fuente de comunicaciones envía un mensaje al receptor. Existe un transmisor para enviar señales a las fuentes de comunicación y un subsistema de prueba de vida para enviar periódicamente un mensaje de prueba de vida a través del transmisor hacia las fuentes de comunicación.

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CAMPO DE LA INVENCION

Esta invención se refiere a sistemas de recuperación de vehículos robados y en particular a una unidad localizadora de vehículos con subsistema y método para enviar mensajes de prueba de vida.

ANTECEDENTES DE LA INVENCION

El exitoso y popular sistema de recuperación de vehículos del solicitante, vendido bajo la marca LoJack® incluye una pequeña unidad electrónica localizadora de vehículos provista de un transpondedor oculto dentro del vehículo, una red privada de torres de comunicación cada una de las cuales lleva una unidad trasmisora remota, uno o más vehículos policiales equipados con una unidad de rastreo de vehículos y un centro de la red con una base de datos de los clientes quienes han adquirido una unidad localizadora de vehículos. El centro de la red interconecta con el Centro Nacional de Información de Delitos. Las entrada de esas base de datos comprenden el número VIN del vehículo del cliente y código de identificación asignado a la unidad localizadora de vehículos del cliente.

Cuando un cliente del producto LoJack® informa que su vehículo ha sido robado, se envía el número VIN del

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mismo a un centro policial para ser ingresado en una base de datos de vehículos robados. El centro de la red incluye software que interconecta con la base de datos del centro policial para comparar el número VIN del vehículo robado con la base de datos del centro de la red, el cual incluye números VIN que corresponden a los códigos de identificación de la unidad localizadora de vehículos. Cuando hay una coincidencia entre un número VIN de un vehículo robado y un código de identificación de la unidad localizadora de vehículos, como podría ser el caso cuando el vehículo robado está equipado con tal unidad localizadora, y cuando el centro ha confirmado que el vehículo ha sido robado, el centro de la red se comunica con las unidades transmisoras remotas de las varias torres de comunicación (corrientemente existen 130 a nivel nacional) y cada una de ellas transmite un mensaje para activar al transpondedor de la unidad particular localizadora de vehículos que lleva el código de identificación.

Se activa así al transpondedor de la unidad localizadora de vehículos que se encuentra en el vehículo robado y comienza a transmitir el código único de identificación de la unidad localizadora de

vehículos. La unidad rastreadora de vehículos de cualquier vehículo policial cercano al vehículo robado recibe este código del transpondedor de la unidad localizadora de vehículos y, tomando como base la intensidad de la señal y la información direccional, el vehículo policial apropiado puede tomar medidas activas para recuperar al vehículo robado. Ver, por ejemplo, Patentes Norteamericanas Nos. 4.177.466, 4.818.988, 4.908.609, 5.704.008, 5.917.423, 6.229.988, 6.522.698 y 6.665.613, todas incorporadas aquí a modo de referencia.

Sin embargo, si falla un componente de la unidad localizadora de vehículos, no puede recibir mensajes desde las torres de comunicación de una red y/o puede fallar para transmitir este código único de identificación de la unidad localizadora para que sea recibido por una o más unidades rastreadoras de vehículos.

Actualmente, las unidades localizadoras de vehículos no están configuradas para transmitir mensajes hacia las torres de comunicación de la red. Así, actualmente no existe ninguna forma para detectar si una unidad localizadora de vehículos ha fallado en el campo de modo que se pueda prestar servicio.

RESUMEN DE LA INVENCION

Por lo tanto, un objetivo de esta invención consiste en proporcionar una unidad localizadora de vehículos con capacidad de enlace.

Un objetivo adicional de esta invención consiste en proporcionar una unidad localizadora de vehículos que pueda ser identificada como en situación de falla y de recibir servicio cuando sea necesario.

Un objetivo adicional de esta invención consiste en proporcionar un método para prestar servicio a unidades localizadoras de vehículos que han fallado en el campo.

La invención nace de la comprensión de que si la unidad localizadora de vehículos está equipada con el transmisor para enviar señales a la red u otras fuentes de comunicación, entonces tal unidad localizadora puede enviar periódicamente por si misma un mensaje de "prueba de vida" a través del transmisor hacia las fuentes de comunicación. Si el mensaje apropiado no es recibido como se esperaba desde una unidad localizadora de vehículos, esa unidad puede ser identificada, localizada y sometida a servicio según sea apropiado.

Sin embargo, la invención en otras formas de la misma no necesita lograr todos estos objetivos y sus

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reivindicaciones no deben estar limitadas a las estructuras o métodos capaz de alcanzar a los mismos.

Esta invención se caracteriza por una unidad localizadora de vehículos con funcionalidad de prueba de vida. Un receptor recibe una señal desde una red de las fuentes de comunicación y se activa un transpondedor cuando una fuente de comunicación envía un mensaje hacia el receptor. Se incluye un transmisor para enviar señales de las fuentes de comunicación y un subsistema de prueba de vida está configurado para enviar un mensaje de prueba de vida a través del transmisor hacia las fuentes de comunicación.

Típicamente, el mensaje de prueba de vida incluye un código único de la unidad localizadora de vehículos y un código de identificación de una fuente de comunicación que transmite la señal más fuerte hacia el receptor para aproximar la posición del vehículo. Preferiblemente, un subsistema determinante de la intensidad de señal indica la fuente de comunicación con la señal más fuerte transmitida al receptor.

Un método para prestar servicio a unidades localizadoras de vehículos que están en situación de falla, de acuerdo con la presente invención, incluye las etapas de configurar a la unidad localizadora para

que envíe periódicamente un mensaje hacia una o más fuentes de comunicación, registre el mensaje en una base de datos y preste servicio a dicha unidad si no se recibe el mensaje. Típicamente, el mensaje incluye un código único de identificación de la unidad localizadora de vehículos y un código de identificación de una fuente de comunicación que transmite la señal más fuerte hacia dicha unidad a fin de aproximar la posición de la unidad localizadora de vehículos.

Un método para operar una unidad localizadora de vehículos de acuerdo con la invención incluye las etapas de recibir señales desde una red de fuentes de comunicación y activar un transpondedor cuando la fuente de comunicación envía un mensaje hacia la unidad localizadora. Se envía periódicamente un mensaje de prueba de vida hacia las fuentes de comunicación de modo que la unidad localizadora de vehículos pueda recibir servicio cuando se detecta que no se ha recibido un mensaje de prueba de vida tal como se esperaba.

BREVE DESCRIPCION DE LOS DIBUJOS

Otros objetivos, características y ventajas serán evidentes para los expertos en el arte en la siguiente descripción de una forma preferida y en los dibujos

adjuntos, en los cuales:

La figura 1 es un diagrama de bloque esquemático que ilustra a los componentes primarios asociados con un ejemplo de un sistema de recuperación de vehículo robado, de acuerdo con la invención.

La figura 2 es un diagrama de bloque que ilustra a los componentes primarios asociados con una forma de una unidad localizadora de vehículos de acuerdo con la invención.

La figura 3 es un diagrama de bloque que ilustra las etapas primarias asociadas con la programación del microcontrolador ilustrado en la figura 2, de acuerdo con una forma de la invención.

DESCRIPCION DE LA FORMA PREFERIDA

Aparte de la forma o formas preferidas descritas más adelante, esta invención contempla otras formas y puede ser llevada a la práctica de varias maneras. Así, se comprenderá que la invención no está limitada en su aplicación de los detalles de construcción y disposiciones de componentes indicados en la siguiente descripción o ilustrados en los dibujos. Si se describe aquí solamente una forma, las reivindicaciones de la invención no están limitadas a esa forma. Además, sus reivindicaciones no deben ser interpretadas

como restrictivas a menos que haya evidencia clara y convincente de que existe cierta exclusión, restricción o renuncia.

Como se vio en la sección anterior de antecedentes, el sistema exitoso y popular de recuperación de vehículos del solicitante, vendido bajo la marca LoJack®, incluye una pequeña unidad electrónica localizadora de vehículos 10, figura 1, con un transpondedor 12 oculto dentro del vehículo 14, una red privada de torres de comunicación 16 cada una con una unidad trasmisora remota 18, uno o más vehículos policiales 20 equipados con una unidad de rastreo de vehículos 22 y un centro 24 de red.

Cuando un cliente del producto LoJack® informa que su vehículo ha sido robado, se notifica el número VIN del vehículo al centro policial 26 a fin de que sea ingresado en la base de datos 28 de vehículos robados. El centro 24 de la red incluye software que interconecta con la base de datos 28 del centro policial 26 para comparar el número VIN del vehículo robado con la base de datos 30 del centro 24 de la red, la cual incluye números VIN que corresponden a los códigos de identificación de la unidad localizadora de vehículos. Cuando hay una coincidencia entre un número

VIN de un vehículo robado y un código de identificación de la unidad localizadora de vehículos, como podría ser el caso cuando el vehículo robado 14 está equipado con la unidad 10 localizadora de vehículos, el centro 24 de la red se comunica con las unidades transmisoras remotas 18 de las varias torres de comunicación 16 y cada torre transmite un mensaje para activar al transpondedor 12 de la unidad 10 localizadora de vehículos que lleva el código particular de identificación.

El transpondedor 12 de la unidad 10 localizadora de vehículos situada en el vehículo robado 14, una vez activado comienza a transmitir un código único de identificación de la unidad localizadora. La unidad 22 rastreadora de vehículos del vehículo policial 20 cercano al vehículo robado 14 recibe este código del transpondedor de la unidad localizadora y, tomando como base la intensidad de la señal y la información direccional, el vehículo policial apropiado puede tomar medidas activas para recuperar a dicho vehículo robado 14.

De acuerdo con la invención, la unidad 10 localizadora de vehículos está configurada para enviar periódicamente un mensaje de prueba de vida tal como se indica con el número 40, hacia una torre de

comunicación 16 de la red, además de recibir mensajes desde la red 42 en caso de un robo del vehículo 14, caso en el cual se activa el trasnpondedor 12. El mensaje 40 de prueba de vida es enviado periódicamente por la unidad 10 localizadora de vehículos e incluye típicamente la identidad de la unidad localizadora y el código de identificación de la torre 16 que tiene la mayor intensidad de señal. Este mensaje es enviado por la unidad transmisora remota 18 hacia el centro 24 de la red y almacenado en la base de datos 30. El software apropiado en el centro 24 escruta a la base de datos 30 periódicamente y, si se encuentra que cualquier unidad localizadora de datos no ha transmitido un mensaje de prueba de vida como se esperaba, se puede generar un mensaje de alarma y se puede prestar servicio de la unidad localizadora de vehículos del cliente. Mediante el almacenamiento del último mensaje de prueba de vida junto con la identidad de la torre más cercana al vehículo 14, se puede determinar el último sitio conocido aproximado del vehículo 14 para prestar mejor servicio a la unidad 10 localizadora de vehículos.

La unidad 10 localizadora de vehículos, en un ejemplo, está ilustrada detalladamente en la figura 2; en dicha unidad el transceptor 50 incluye funcionalidad

de recepción de mensaje y transmisión de mensaje. Cualquier señal recibida por el transceptor 50 es analizada con respecto a la intensidad de señal por el subsistema 52 para vigilar tal intensidad de señal; dicho subsistema puede ser un desmodulador asociado con el transceptor 50. Así, el transceptor 50 envía al microcontrolador 54 una señal indicativa de cualquier mensaje recibido por dicho transceptor y también la intensidad de la señal o señales recibidas por este último. Si el mensaje recibido por el controlador 54 indica un evento de robo, el controlador 54 envía señales al transpondedor 12 y así queda activado para transmitir una señal que puede ser detectada por la unidad de rastreo de vehículos 22, figura 1, del vehículo policial 20.

Sin embargo, el controlador 54 de acuerdo con esta invención está programado también para incluir un subsistema de prueba de vida que envía periódicamente una señal por la línea 56 hacia el transceptor 50, dando lugar a que este último transmita un mensaje de prueba de vida 40, figura 1, que incluye el código de identificación de la unidad 10 localizadora de vehículos y el código de identificación de la torre de la red, en forma previa o junto con la transmisión de

la señal más fuerte hacia el transceptor 50. En una forma, el controlador 54 es Texas Instrument modelo MSP 430, con su propia memoria EE prom para almacenar estos dos códigos de identificación. En la misma forma, el controlador 54 incluye su propio reloj interno para sincronizar la periodicidad de la transmisión del mensaje de prueba de vida. Se puede programar la periodicidad de la señal de prueba de vida y puede ocurrir cada día, cada semana o inclusive a intervalos más prolongados.

Así, se programa al controlador 54, figura 2, para contar, etapa 60, figura 3, hasta llegar al período predeterminado de prueba de vida, etapa 62, y luego se determina el código de identificación de la unidad 10 localizadora de vehículos y el código de identificación de la torre de la red que tiene la señal más fuerte, a partir de la memoria 64, etapa 66. Luego, el controlador 54 recoge estos datos y señales, etapa 68 del transceptor 50, figura 2, para transmitir el mensaje de prueba de vida a través de la antena 51 hacia la red, figura 1, después de lo cual la unidad transmisora remota 18 envía el mensaje de prueba de vida al contro 24 para que sea almacenado en la base de datos 30 con propósitos de análisis y escrutinio periódicos tal como

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se explicó anteriormente.

En otros ejemplos, se envía el mensaje de prueba de vida hacia las torres de red fuera de la red privada, por ejemplo, equipando a la unidad 10 localizadora de vehículos, figura 1, con un transmisor de teléfono celular para transmitir el mensaje de prueba de vida a través de una red de teléfonos celulares.

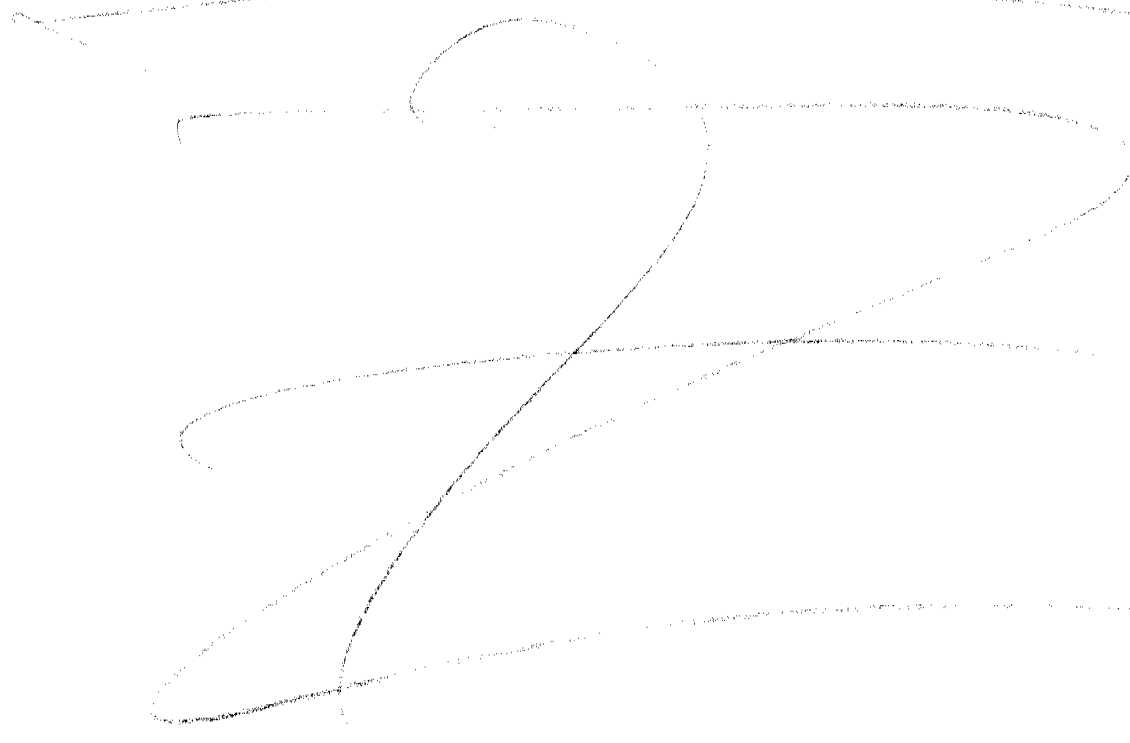
Así, aunque se ilustra características específicas de la invención en algunos dibujos y en otros no, esto es por conveniencia solamente ya que cada característica puede ser combinada con cualesquiera o todas las demás características de acuerdo con la invención. Las palabras "incluyendo", "comprendiendo", "teniendo" y "con", tal como se emplea aquí, deben ser interpretadas en forma amplia y comprensiva y no están limitadas a cualquier interconexión física. Además, cualesquiera formas descritas en la solicitud no deben ser tomadas como solamente formas posibles. Otras formas serán evidentes para los expertos en el arte y caen dentro de las siguientes reivindicaciones.

Además, cualquier omisión presentada durante el trámite de la solicitud de esta patente no es una renuncia de cualquier elemento de reivindicación presentado en la solicitud tal como fue presentada; los

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expertos en el arte que se redacte una reivindicación que podría abarcar literalmente todos los equivalentes posibles ya que muchos equivalentes serán no pronosticables en el momento de la enmienda y están más allá de una interpretación clara de aquello a lo cual se debe renunciar (si hubiese algo susceptible de renuncia); la exposición razonada que sustenta a la enmienda puede comportar no más que una relación tangencial con muchos equivalentes; y/o existen muchas otras razones por las cuales no se puede esperar que el solicitante describa ciertos sustitutos no importantes para cualquier elemento enmendado de la reivindicación.



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REIVINDICACIONES

2 1. Una unidad localizadora de vehículos con funcionalidad de prueba de vida, la cual comprende:

un receptor que recibe una señal desde una red de fuentes de comunicación;

un transpondedor que se activa cuando una fuente de comunicación envía un mensaje al receptor;

un transmisor para enviar señales; y

un subsistema de prueba de vida configurado para enviar periódicamente un mensaje de prueba de vida a través del transmisor.

2. La unidad localizadora de vehículos, de acuerdo con la reivindicación 1, en la cual el mensaje de prueba de vida incluye un código único de identificación de la unidad localizadora de vehículos.

3. La unidad localizadora de vehículos, de acuerdo con la reivindicación 2, en la cual el mensaje de prueba de vida incluye además un código de identificación de una fuente de comunicación que transmite la señal más fuerte hacia el receptor, para aproximar la posición del vehículo.

4. La unidad localizadora de vehículos, de acuerdo con la reivindicación 3, incluyendo además un

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subsisistema determinante de la intensidad de señal a fin de indicar la fuente de comunicación con la señal más fuerte transmitida al receptor.

5. La unidad localizadora de vehículos, de acuerdo con la reivindicación 1, en la cual el transmisor envía el mensaje de prueba de vida a la red de fuentes de comunicación.

6. Un método para prestar servicio a unidad de localización de vehículos en situación de falla; dicho método comprende:

configurar a la unidad localizadora de vehículos para enviar periódicamente un mensaje a una o más fuentes de comunicación;

registrar dicho mensaje en una base de datos; y

prestar servicio a la unidad localizadora de vehículos si no se recibe dicho mensaje.

7. El método, de acuerdo con la reivindicación 6, en el cual el mensaje incluye un código único de identificación de la unidad localizadora de vehículos y un código de identificación de una fuente de comunicación que transmite la señal más fuerte hacia dicha unidad localizadora, para aproximar la posición de la misma.

8. Un método para operar una unidad localizadora de

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vehículos, el cual comprende:

recibir señales desde una red de fuentes de comunicación;

activar un transpondedor cuando una fuente de comunicación envía un mensaje a la unidad localizadora de vehículos; y

enviar periódicamente un mensaje de prueba de vida hacia las fuentes de comunicación.

9. El método, de acuerdo con la reivindicación 8, en el cual el mensaje de prueba de vida incluye un código único de identificación de la unidad localizadora de vehículos.

10. El método, de acuerdo con la reivindicación 9, en el cual el mensaje de prueba de vida incluye además un código de identificación de una fuente de comunicación que transmite la señal más fuerte al receptor a fin de aproximar la posición del vehículo.

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X 7

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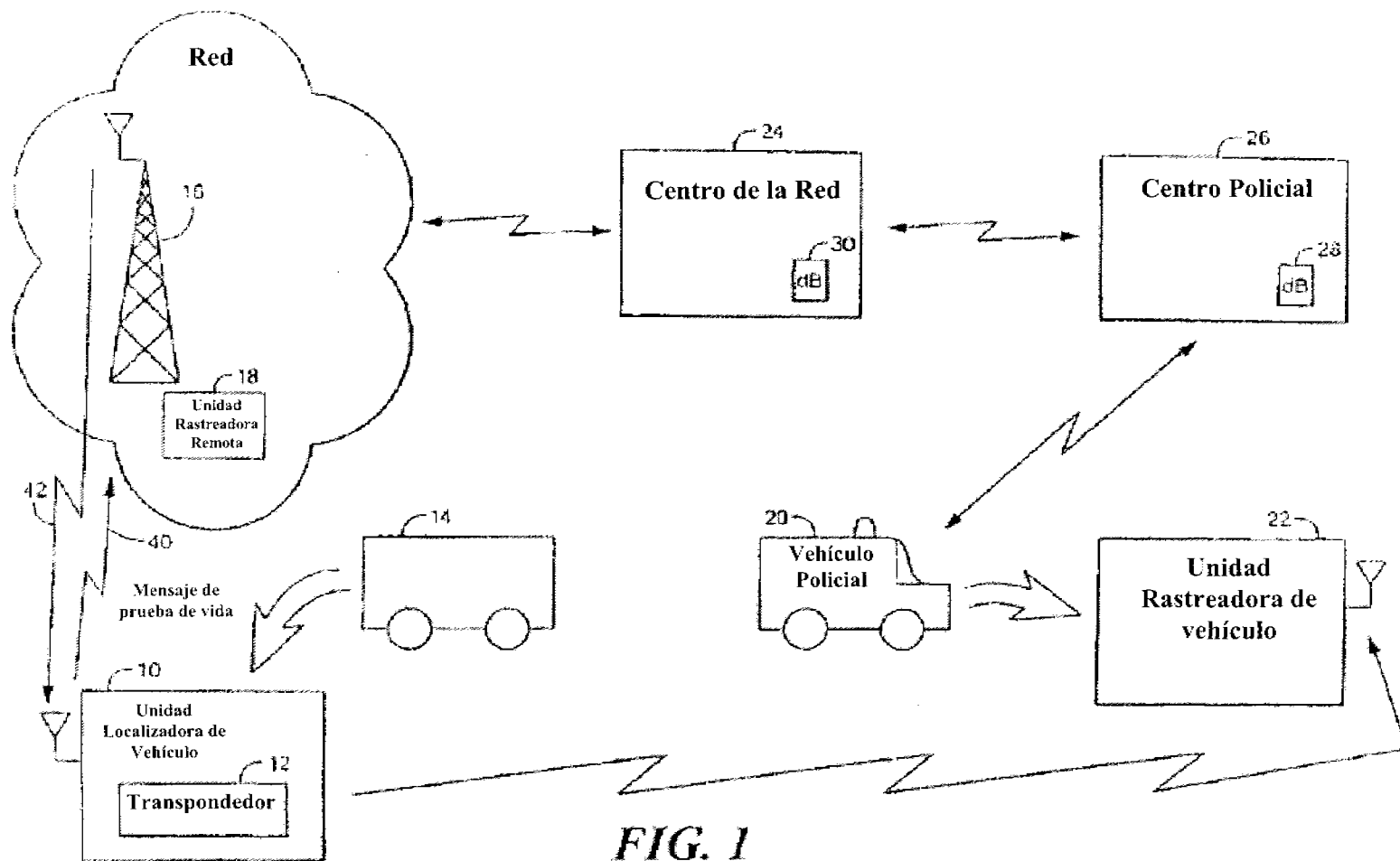


FIG. 1

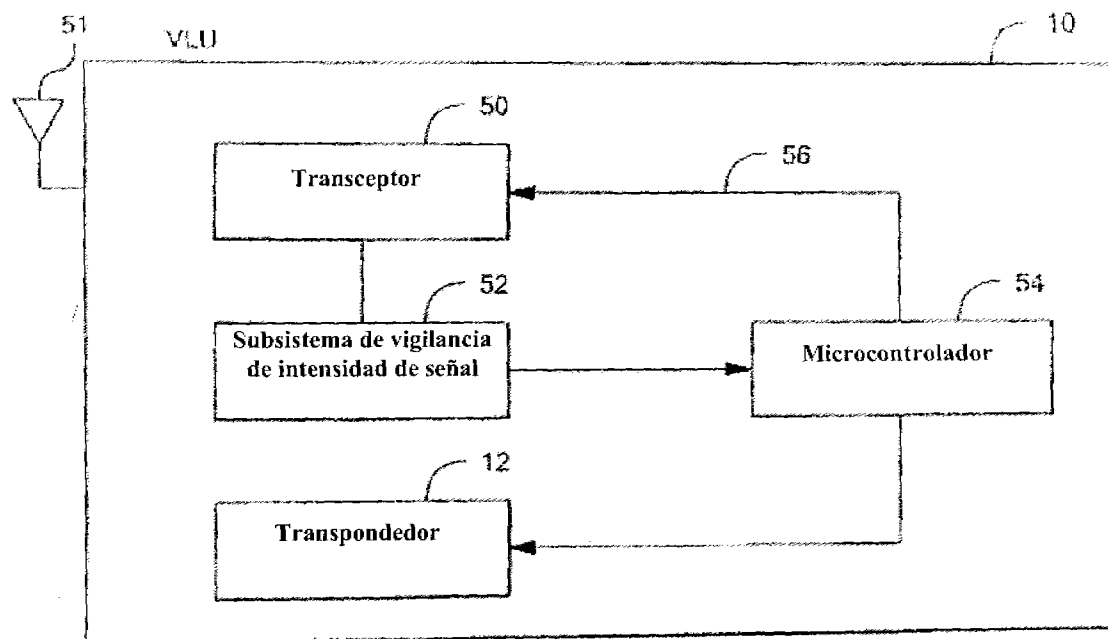


FIG. 2

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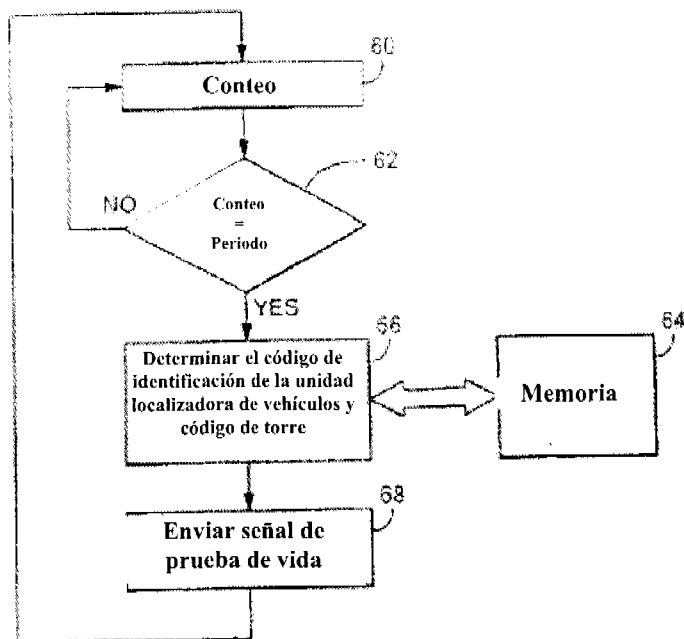


FIG. 3

WORLD INTELLECTUAL PROPERTY ORGANIZATION (WIPO)
ORGANISATION MONDIALE DE LA PROPRIÉTÉ INTELLECTUELLE (OMPI)



PCT

(Patent Cooperation Treaty)

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Tel (41-22) 338 9111 - Telex 412 912 ompi ch

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Date : 23 August 2007 (23.08.2007) Fax : 781-890-1150

To : SHANSKE, Jason, D.
Iandiorio & Teska
260 Bear Hill Road
Waltham, MA 02451-1018
ETATS-UNIS D'AMERIQUE

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AUG 28 2007

IANDIORIO & TESKA

File : LOJACK-115T
reference

From : Jean-Luc Martin

Telephone : +41 22 338 74 01
Email : PT01.PCT@WIPO.INT
address

Concerns : PCT/US2006/018962

Number of pages including cover sheet : 1

Attention: Thomas E. Thompkins, Jr.

Dear Sir,

Pursuant to your facsimile communication dated 22 August 2007, please note that due to a clerical oversight, applicant/inventor HOWE, Timothy, David was omitted on the cover page of international publication WO 2006/124924 dated 23 November 2006. This oversight was seen upon receipt of the demand and Form PCT/IB/306 was issued, adding the missing applicant/inventor to the record.

Please be informed that following this correction, the cover page of the application will be republished, listing HOWE, Timothy, David as inventor, applicant for the US only.

The International Bureau apologizes for the inconvenience caused.

With best regards,

Jean-Luc Martin
Processing Team1

Fax : +41 22 338 87 40

AA

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The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below.

IPEA/ US

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty.

For International Preliminary Examining Authority use only			
Identification of IPEA		Date of receipt of DEMAND	
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION			Applicant's or agent's file reference
International application No. PCT/US06/018962	International filing date (day/month/year) 17 May 2006 (17/05/06)	(Earliest) Priority date (day/month/year) 18 May 2005 (18/05/05)	
Title of invention VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD			
Box No. II APPLICANT(S)			
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) LOJACK OPERATING COMPANY LP 200 Lowder Brook Drive Westwood, MA 02090 UNITED STATES			Telephone No.
			Facsimile No.
			Teleprinter No.
			Applicant's registration No. with the Office
State (that is, country) of nationality: UNITED STATES		State (that is, country) of residence: UNITED STATES	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) ROMANO, Frank 6 Jasper Street Westborough, MA 01581 UNITED STATES			
State (that is, country) of nationality: UNITED STATES		State (that is, country) of residence: UNITED STATES	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) KRISHNA, Sampath 115 Main Street Winchester, MA 01890 UNITED STATES			
State (that is, country) of nationality: UNITED STATES		State (that is, country) of residence: UNITED STATES	
☒ Further applicants are indicated on a continuation sheet.			

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

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NGUYEN, Son
44 Pembroke Street
Marlborough, MA 01752
UNITED STATES

State (that is, country) of nationality:
UNITED STATES

State (that is, country) of residence:
UNITED STATES

Name and address: (Family name followed by given name, for a legal entity, full official designation. The address must include postal code and name of country.)

RHODES, Jesse
291 Prospect Street
Franklin, MA 02038
UNITED STATES

State (that is, country) of nationality:
UNITED STATES

State (that is, country) of residence:
UNITED STATES

Name and address: (Family name followed by given name, for a legal entity, full official designation. The address must include postal code and name of country.)

CREWE, Philip Grahame
3 Granta Vale
Linton, Cambridgeshire CB1 6LB
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

Name and address: (Family name followed by given name, for a legal entity, full official designation. The address must include postal code and name of country.)

CLETHEROE, Daniel Jonathan Finchley
Flat 4 Granthams Court
De Freville Road
Great Shelford
Cambridge CB2 5LH
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

☒ Further applicants are indicated on another continuation sheet.

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

MARSDEN, Mark
38 Lambert Cross
Saffron Walden
Essex CB10 2DP
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

GREENDALE, Steven Walter
15 Bosworth Road
Cambridge CB1 8RG
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

WATSON, Nigel James
14 Mill Lane
Whittleford
Cambridgeshire CB2 4NE
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

STROUD, Ian Christopher
"Knotty Oak"
Frambury Lane
Newport, Essex CB11 3PY
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

☒ Further applicants are indicated on another continuation sheet.

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

HOWE, Timothy David
76 Birch Trees Road
Great Shelford
Cambridgeshire CB2 5AW
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

SMITH, Gerard Edward
21 Standrums
Great Dunmow
Essex CM6 1TY
UNITED KINGDOM

State (that is, country) of nationality:
UNITED KINGDOM

State (that is, country) of residence:
UNITED KINGDOM

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

State (that is, country) of nationality:

State (that is, country) of residence:

☐ Further applicants are indicated on another continuation sheet.

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative
 and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.
☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.
☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

SHANSKE, Jason D., LANDIORIO, Joseph S., TESKA, Kirk C.,
 COLEMAN, Roy J., THOMPkins, Thomas E., Jr., POIRIER, David W.

all of:

landiorio & Teska
 260 Bear Hill Road
 Waltham, MA 02451
 UNITED STATES

Telephone No.

(781) 890-5678

Facsimile No.

(781) 890-1150

Teleprinter No.

Agent's registration No. with the Office
 43,915

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION**Statement concerning amendments:***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filed

the description ☒ as originally filed

☐ as amended under Article 34

the claims ☐ as originally filed

☐ as amended under Article 19 (together with any accompanying statement)

☒ as amended under Article 34

the drawings ☒ as originally filed

☐ as amended under Article 34

2. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. ☐ Where the IPEA wishes to start the international preliminary examination at the same time as the international search in accordance with Rule 69.1(b), the applicant requests the IPEA to postpone the start of the international preliminary examination until the expiration of the applicable time limit under Rule 69.1(d).

4. ☐ The applicant expressly wishes the international preliminary examination to start earlier than at the expiration of the applicable time limit under Rule 54bis.1(a).

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed

☐ which is the language of a translation furnished for the purposes of international search

☐ which is the language of publication of the international application

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination

Box No. V ELECTION OF STATES

The filing of this demand constitutes the election of all Contracting States which are designated and are bound by Chapter II of the PCT.

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Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | | |
|--|---|-------|--------|
| 1. translation of international application | : | _____ | sheets |
| 2. amendments under Article 34 | : | 3 | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | _____ | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | _____ | sheets |
| 5. letter | : | 2 | sheets |
| 6. other (<i>specify</i>)
Reply to Written Opinion | : | 5 | sheets |

For International Preliminary
Examining Authority use only

- | | |
|--------------------------|--------------------------|
| received | not received |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |
| ☐ | ☐ |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|---|
| 1. ☒ fee calculation sheet | 5. ☐ statement explaining lack of signature |
| 2. ☐ original separate power of attorney | 6. ☐ sequence listing in electronic form |
| 3. ☐ original general power of attorney | 7. ☐ tables in electronic form related to a sequence listing |
| 4. ☐ copy of general power of attorney; reference number, if any: | 8. ☐ other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).


Jason D. Shanske

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

- | | |
|--|--|
| 3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.
☐ The applicant has been informed accordingly. | 6. ☐ The date of receipt of the demand is AFTER the expiration of the time limit under Rule 54bis.1(a) and item 7 or 8, below, does not apply. |
| 4. ☐ The date of receipt of the demand is WITHIN the time limit of 19 months from the priority date as extended by virtue of Rule 80.5. | 7. ☐ The date of receipt of the demand is WITHIN the time limit under Rule 54bis.1(a) as extended by virtue of Rule 80.5. |
| 5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82. | 8. ☐ Although the date of receipt of the demand is after the expiration of the time limit under Rule 54bis.1(a), the delay in arrival is EXCUSED pursuant to Rule 82. |

For International Bureau use only

Demand received from IPEA on:

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CHAPTER II

PCT

FEE CALCULATION SHEET

Annex to the Demand

International application No. PCT/US06/018962	For International Preliminary Examining Authority (IPEA) only
Applicant's or agent's file reference LOJACK-115T	Date stamp of the IPEA
Applicant LOJACK OPERATING COMPANY LP	
CALCULATION OF PRESCRIBED FEES	
1. Preliminary examination fee	600.00 P
2. Handling fee (<i>Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.</i>)	155.00 H
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box	755.00 TOTAL
MODE OF PAYMENT	
☒ authorization to charge deposit account with the IPEA (see below)	☐ cash
☒ cheque	☐ revenue stamps
☐ postal money order	☐ coupons
☐ bank draft	☐ other (specify):
AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT (This mode of payment may not be available at all IPEAs)	
☐ Authorization to charge the total fees indicated above.	IPEA/ US
☒ (This check-box may be marked only if the conditions for deposit accounts of the IPEA so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	Deposit Account No. 09-0002
	Date: 6/8/07
	Name: Jason D. Shanske
	Signature: <i>Jason D. Shanske</i>

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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:
JASON SHANSKE
IANDIORIO & TESKA
260 BEAR HILL ROAD
WALTHAM, MASSACHUSETTS 02451

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

Date of mailing
(day/month/year) 17 Jul 2007

Applicant's or agent's file reference
LOJACK-115T

IMPORTANT NOTIFICATION

International application No.
PCT/US2006/018962

International filing date (day/month/year)
17 May 2006

Priority date (day/month/year)
18 May 2005

Applicant
LOJACK OPERATING COMPANY LP

- 1 The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application

08 Jun 2007

- 2 That date of receipt is:

☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b))

☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).

☐ the date on which this Authority has, in response to the invitation to amend the demand (Form PCT/IPEA/404), received the required corrections.

RECEIVED

JUL 19 2007

IANDIORIO & TESKA

- 3 ☐ **ATTENTION:** That date of receipt is after the expiration of 19 months from the priority date. Consequently, in respect of some Offices, the demand does not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)) and the acts for entry into the national phase must therefore be performed within 20 months from the priority date (or later in some Offices). However, in respect of some other Offices, the time limit of 30 months (or later) may nevertheless apply. See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site

☐ (if applicable) This notification confirms the information given by telephone, facsimile transmission or in person on

- 4 Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau

Name and mailing address of the IPEA/
Mail Stop PCT, Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450
Facsimile No. 571-273-3201

Authorized officer
Nisa Gilchrist-Jones
Telephone No. 703-308.9290 EX 143

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
JASON D. SHANSKE
LANDIORIO & TESKA
260 BEAR HILL ROAD
WALTHAM, MA 02451-1018

MAR 29 2007

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's life reference LOJACK-115T	Date of mailing (day/month/year) FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US06/18962	International filing date (day/month/year) 17 May 2006 (17.05.2006)
Applicant LOJACK OPERATING COMPANY LP	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

 Filing of amendments and statement under Article 19:
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

 When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

 Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
 1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70.

 For more detailed instructions, see the notes on the accompanying sheet.
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
 - ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
 - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Reminders**
 Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

 The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

 Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

 In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

 See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the PCT Applicant's Guide, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Jeff Hofmann Jacqueline A. Whitfield Special Project Asst. Telephone No. 571 272-2600
---	--

Form PCT/ISA/220 (January 2004)

(See notes on accompanying sheet)

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
JASON D. SHANSKE
IANDIORIO & TESKA
260 BEAR HILL ROAD
WALTHAM, MA 02451-1018

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference LOJACK-115T	Date of mailing (day/month/year) 27 MAR 2007
International application No. PCT/US06/18962	International filing date (day/month/year) 17 May 2006 (17.05.2006)
Applicant LOJACK OPERATING COMPANY LP	

- 1 ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70.

For more detailed instructions, see the notes on the accompanying sheet.

- 2 ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

- 3 ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4 **Reminders**

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the PCT Applicant's Guide, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn. ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Jeff Hofass Jacqueline A. Whitfield Special Project Asst. Telephone No. 571 272-2600
--	---

Form PCT/ISA/220 (January 2004)

(See notes on accompanying sheet)

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From the INTERNATIONAL BUREAU

PCTNOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

SHANSKE, Jason, D.
Iandiorio & Teska
260 Bear Hill Road
Waltham, MA 02451-1018
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 08 August 2007 (08.08.2007)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference LOJACK-115T	
International application No. PCT/US2006/018962	International filing date (day/month/year) 17 May 2006 (17.05.2006)

1. The following indications appeared on record concerning:		
☐ the applicant ☐ the inventor ☐ the agent ☐ the common representative		
Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
☒ the person ☐ the name ☐ the address ☐ the nationality ☐ the residence		
Name and Address HOWE, Timothy, David 76 Birch Trees Road Great Shelford Cambridgeshire CB2 5AW United Kingdom	State of Nationality GB	State of Residence GB
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	
3. Further observations, if necessary: The person identified in Box 2 should be added to the record as applicant for the United States of America only and inventor for all designated States.		
4. A copy of this notification has been sent to:		
☒ the receiving Office ☒ the designated Offices concerned ☐ the International Searching Authority ☐ the elected Offices concerned ☐ the International Preliminary Examining Authority ☐ other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Grangier Sandrine e-mail pt01.pct@wipo.int Telephone No. +41 22 338 74 01
---	---

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PCT

6LB (GB). **CLETHEROE, Daniel, Jonthan, Finchley** [GB/GB]; Flat 4 Granthams Court, De Freville Road, Great Shelford, Cambridge CB2 5LH (GB). **MARSDEN, Mark** [GB/GB]; 38 Lambert Cross, Saffron Walden, Essex CB10 2DP (GB). **GREENDALE, Steven, Walter** [GB/GB]; 15 Bosworth Road, Cambridge CB1 8RG (GB). **WATSON, Nigel, James** [GB/GB]; 14 Mill Lane, Whittlesford, Cambridgeshire CB2 4NE (GB). **STROUD, Ian, Christopher** [GB/GB]; "Knotty Oak", Frambury Lane, Newport, Essex CB11 3PY (GB). **SMITH, Gerard, Edward** [GB/GB]; 21 Standrums, Great Dunmow, Essex CM6 1TY (GB).

(74) Agents: SHANSKE, Jason, D. et al.; Iandiorio & Teska, 260 Bear Hill Road, Waltham, MA 02451-1018 (US).

(81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

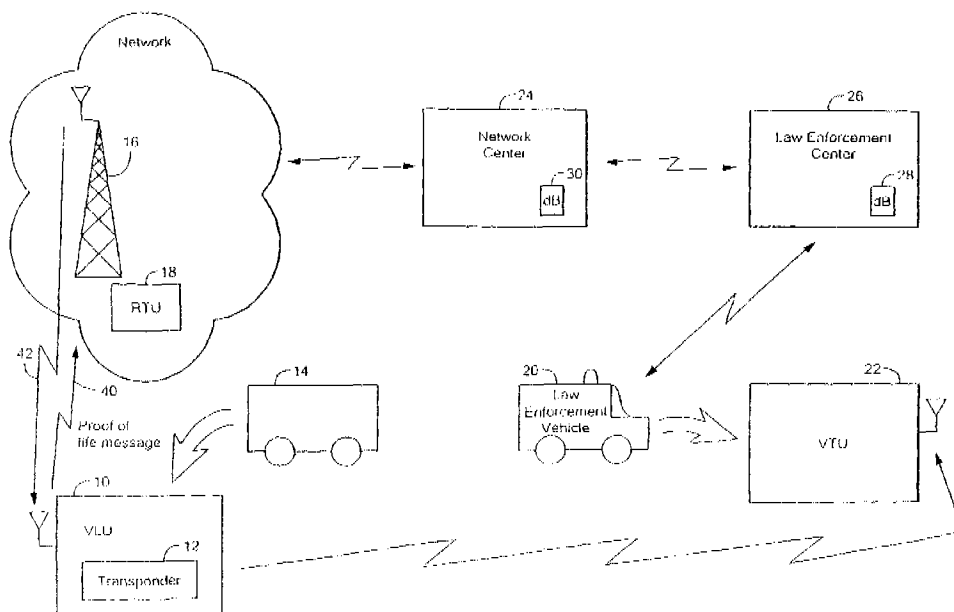
(30) **Priority Data:**
11/131.848 18 May 2005 (18.05.2005) US

(71) **Applicant** (for all designated States except US): **LO-JACK OPERATING COMPANY LP** [US/US]; 200 Lowder Brook Drive, Westwood, MA 02090 (US).

(72) Inventors; and

(75) **Inventors/Applicants (for US only): ROMANO, Frank** [US/US]; 6 Jasper Street, Westborough, MA 01581 (US). **KRISHNA, Sampath** [US/US]; 115 Main Street, Winchester, MA 01890 (US). **NGUYEN, Son** [US/US]; 44 Pembroke Street, Marlborough, MA 01752 (US). **RHODES, Jesse** [US/US]; 291 Prospect Street, Franklin, MA 02038 (US). **CREWE, Philip, Grahame** [GB/GB]; 3 Granta Vale, Linton, Cambridgeshire XX CB1

(54) Title: VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD



(57) **Abstract:** A vehicle locating unit features a receiver which receives a signal from a network of communication sources and a transponder activated when a communication source sends a message to the receiver. There is a transmitter for sending signals to the communication sources and a proof of life subsystem configured to periodically send a proof of life message via the transmitter to the communication sources.

WO 2006/124924 A3



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(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

(88) **Date of publication of the international search report:**

21 June 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US06/18962

A. CLASSIFICATION OF SUBJECT MATTER IPC: G08G 1/123(2006.01) USPC: 340/988 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) U.S. : Please See Continuation Sheet 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 practicable, search terms used)														
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category *</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 6,211,818 B1 (ZACH, Sr.) 3 April 2001 (03.04.2001), entire document</td> <td>1-2, 5-6, 8-9</td> </tr> <tr> <td>Y</td> <td></td> <td>3-4, 7, 10</td> </tr> <tr> <td>Y</td> <td>US 2002/0005804 A1 (SUPRUNOV) 17 January 2002 (17.01.2002), entire document</td> <td>3-4, 7, 10</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 6,211,818 B1 (ZACH, Sr.) 3 April 2001 (03.04.2001), entire document	1-2, 5-6, 8-9	Y		3-4, 7, 10	Y	US 2002/0005804 A1 (SUPRUNOV) 17 January 2002 (17.01.2002), entire document	3-4, 7, 10
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.												
X	US 6,211,818 B1 (ZACH, Sr.) 3 April 2001 (03.04.2001), entire document	1-2, 5-6, 8-9												
Y		3-4, 7, 10												
Y	US 2002/0005804 A1 (SUPRUNOV) 17 January 2002 (17.01.2002), entire document	3-4, 7, 10												
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.														
* Special categories of cited documents: <table border="0"> <tr> <td style="vertical-align: top;"> "A" document defining the general state of the art which is not considered to be of particular relevance "B" earlier application or patent 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 "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "B" earlier application or patent 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 "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family										
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Date of the actual completion of the international search 02 February 2007 (02.02.2007)		Date of mailing of the international search report 27 MAR 2007												
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer Jeff Hofsass Jacqueline A. Whitfield Special Project Asst. Telephone No. 571 272-2890												

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/18962

Continuation of B. FIELDS SEARCHED Item 1:
340/988, 426
342/357.07, 357.09

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
JASON D. SHANSKE
IANDIORIO & TESKA
260 BEAR HILL ROAD
WALTHAM, MA 02451-1018

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) 27 MAR 2007	
FOR FURTHER ACTION See paragraph 2 below	
Applicant's or agent's file reference LOJACK-115T	
International application No. PCT/US06/18962	International filing date (day/month/year) 17 May 2006 (17.05.2006)
Priority date (day/month/year) 18 May 2005 (18.05.2005)	
International Patent Classification (IPC) or both national classification and IPC IPC: G08G 1/123 (2006.01) USPC: 340/988	
Applicant LOJACK OPERATING COMPANY LP	

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P. O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Date of completion of this opinion 02 February 2007 (02.02.2007)	Authorized officer Jeff Hofsass Jacqueline A. Whitfield Special Project Asst. Telephone No. 571 272-2600
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Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US06/18962

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

- a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
- b. format of material
☐ on paper
☐ in electronic form
- c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in electronic form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/18962

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>3-4, 7, 10</u>	YES
	Claims <u>1-2, 5-6, 8-9</u>	NO
Inventive step (IS)	Claims <u>none</u>	YES
	Claims <u>1-10</u>	NO
Industrial applicability (IA)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations

Please See Continuation Sheet

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/18962

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

V. 2. Citations and Explanations:

1. Claim(s) 1-2, 5-6, 8-9 lack novelty under PCT Article 33(2) as being anticipated by Zach, Sr. (US 6211818).

As to claim 1, Zach discloses:

A vehicle locating unit with proof of life functionality comprising: a receiver which receives a signal from a network of communication sources; a transponder activated when a communication source sends a message to the receiver, a transmitter for sending signals; and a proof of life subsystem configured to periodically send a proof of life message via the transmitter ([3, 65] to [4, 47]; [1, 1-35]).

As to claim 2, Zach discloses:

the proof of life message includes a unique vehicle locating unit identification code ([3, 65] to [4, 47]).

As to claim 5, Zach discloses:

the transmitter transmits the proof of life message to the network of communication sources ([3, 65] to [4, 47]).

As to claim 6, Zach discloses:

A method of servicing failed vehicle locating units, the method comprising: configuring the vehicle locating unit to periodically send a message to one or more communication sources; logging said message in a database; and servicing said vehicle locating unit if said message is not received ([3, 65] to [4, 47]; [3, 17-35]).

As to claim 8, Zach discloses:

A method of operating a vehicle locating unit, the method comprising: receiving signals from a network of communication sources; activating a transponder when a communication source sends a message to vehicle locating unit; and periodically sending a proof of life message to the communication sources.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US06/18962

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

As to claim 9, Zach discloses:

the proof of life message includes a unique vehicle locating unit identification code (see claim 2).

2. Claim(s) 3-4, 7, 10 lack an inventive step under PCT Article 33(3) as being obvious over Zach (6211818) in view of Suprunov (US 2002/0005804).

As to claim 3,

Zach does not expressly teach the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle

Reed discloses the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle ([0021-0024]; [0017]).

It would have been obvious to one of ordinary skill in the art to modify Zach to teach the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle, as taught by Suprunov, so as to calculate a position of the mobile unit, and to provide an alternate less complicated location technique.

As to claim 4, Suprunov discloses:

further including a signal strength determining subsystem for determining the communication source with the strongest signal transmitted to the receiver [0022].

As to claim 7, Zach discloses:

the message includes a unique vehicle locating unit identification code and an identification code of a communication source transmitting the strongest signal to the vehicle locating unit to approximate the position of the vehicle locating unit (see claim 3).

As to claim 10, Zach discloses:

the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle (see claim 3).

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When ? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How ? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

International Application No.: PCT/US06/018962
International Filing Date: May 17, 2006
Applicant: LoJack Operating Company LP
For: VEHICLE LOCATING UNIT PROOF OF LIFE
SUBSYSTEM AND METHOD
Docket No.: LOJACK-115T

Mail Stop PCT
Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service, Express Mail Certificate No. EV926904728US in an envelope addressed to Mail Stop PCT, Attn: ISA/US, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

June 8, 2007.

Joanne M. Cecchini
Joanne M. Cecchini

REPLY TO PCT WRITTEN OPINION

This Reply is in response to the PCT Written Opinion mailed March 27, 2007 in the subject application.

REMARKS

The applicant appreciates the Examiner's thorough examination of the application and requests reexamination and reconsideration of the application in view of the following remarks.

The Examiner alleges that claims 1-2, 5-6, and 8-9 lack novelty under PCT Article 33(2) as being anticipated by U.S. Patent No. 6,211,818 to Zach.

Zach discloses an Automatic Moving Vehicle Alert Unit (AMVA) which includes a

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computer chip 7 and a keyboard 9 for inputting an identification code. In accordance with Zach, the user of the vehicle inputs an identification code into the AMVA prior to starting and operating the vehicle. If the correct code is not entered, the GPS determined location of the vehicle and the time are transmitted to a communication satellite system, which in turn sends a signal to a fixed data communication device at a database station. If the correct code is entered, the AMVA continues to transmit data signals as long as the vehicle's engine is running. Once the engine shuts off, the last location and time are stored on the computer chip.

Claim 1 of the subject application is directed to a vehicle locating unit with proof of life functionality comprising a receiver which receives a signal from a network of communication sources, a transponder activated when a communication source sends a message to the receiver, a transmitter for sending signals, and a proof of life subsystem configured to periodically send a proof of life message via the transmitter. Independent claim 8 is a method claim which corresponds to claim 1.

In accordance with the subject invention, when an individual reports that their vehicle has been stolen, the VIN number of the vehicle is reported to a law enforcement center for entry into a database of stolen vehicles. A network center includes software that interfaces with the law enforcement center database to compare the VIN number of the stolen vehicle with a database of the network center which includes VIN numbers corresponding to vehicle location unit (VLU) identification codes. When there is a match between a VIN number of a stolen vehicle and a VLU identification code, as would be the case when a stolen vehicle is equipped with a VLU, the network center communicates with the remote transmitting units (RTUs) of the private network of communication towers, and each tower transmits a message to activate the transponder of the VLU bearing the particular identification code. Once activated, the transponder begins transmitting a unique VLU identification code. Law

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enforcement vehicles equipped with a vehicle tracking unit (VTU) proximate the stolen vehicle receive this VLU transponder code and, based on signal strength and directional information, the appropriate law enforcement vehicle can take active steps to recover the stolen vehicle.

Zach fails to disclose a receiver which receives a signal from a network of communication sources, and a transponder activated when a communication source sends a message to the receiver as claimed by the applicant in independent claim 1. The only receiver disclosed by *Zach* is GPS receiver 13, which receives signals from a remote GPS satellite system orbiting the earth which indicate the location on earth of the GPS receiver. However, nowhere does *Zach* disclose a receiver for receiving a signal from a network of communication sources as claimed by the applicant.

Additionally, *Zach* fails to disclose a transponder activated when a communication source sends a message to the receiver as claimed by the applicant. As noted above, the only receiver of *Zach* is the GPS receiver. However, the transmitter of *Zach* is not activated when a message is sent to the GPS receiver. *Zach* states that once the correct code has been entered into the AMVA, the GPS receiver is activated. See Col. 3, lines 36-38 of *Zach*. However, if the correct code is not entered into the system when the vehicle is started, the AMVA transmits the last location and time information stored in computer chip 7. See Col. 3, lines 23-35 of *Zach*. Thus, when the correct code is not entered into the AMVA of *Zach*, the GPS receiver is not yet activated, yet the transmitter is activated. Accordingly, the transmitter of *Zach* is clearly not activated when a communication source sends a message to the receiver, but is activated independent of the receiver.

Therefore, the applicant submits that *Zach* fails to disclose a transponder activated when a communication source sends a message to the receiver as claimed by the applicant in independent claims 1 and 8. Accordingly, independent claims 1 and 8, and dependent claims

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2-5 and 9-10 are novel over Zach.

Independent claim 6 of the subject application is directed to a method of servicing failed vehicle locating units, the method comprising configuring the vehicle locating unit to periodically send a message to one or more remote communication sources, logging said message in a database, and servicing said vehicle locating unit if said message is not received.

Zach discloses a second housing 22 with a computer chip unit and a conventional GPS receiver unit which is connected to the main AMVA unit 5 and may be placed in a different portion of the vehicle. The second unit 22 constantly sends a detection signal to the main AMVA unit. If a response detection signal is not received back, the second unit transmits the location and time of the vehicle to the database station 17. See Col. 4, lines 25-45 and Fig. 1 of Zach.

The Examiner appears to be equating the constant detection signal sent by the second unit to the main AMVA unit of Zach to the periodic message as claimed by the applicant. However, the applicant claims that the message is periodically sent to one or more remote communication sources. The signal of Zach is not sent to a remote source as claimed by the applicant but is instead sent to a connected unit.

Accordingly, the applicant submits that Zach fails to disclose configuring the vehicle locating unit to periodically send a message to one or more remote communication sources as claimed by the applicant. Therefore, independent claim 6 and dependent claim 7 are novel over Zach.

The Examiner also alleges that dependent claims 3-4, 7 and 10 lack an inventive step under PCT Article 33(3) as being obvious over Zach in view of U.S. Patent Application Publication No. 20020005804 to Suprunov. As noted above, Zach fails to disclose several features of the claimed invention of independent claims 1, 6, and 8. Suprunov also fails to

disclose these features of the applicant's claimed invention. Therefore, claims 3-4, 7 and 10 which depend from independent claims 1 and 8 have an inventive step over the references for at least the reasons shown above.

Each of the Examiner's rejections has been addressed or traversed. It is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts at (781) 890-5678.

Respectfully submitted,

Jason D. Shanske
Reg. No. 43,915

JDS/jmc
Enclosures

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1. A vehicle locating unit with proof of life functionality comprising:
a receiver which receives a signal from a network of communication sources;
a transponder activated when a communication source sends a message to the receiver;
a transmitter for sending signals; and
a proof of life subsystem configured to periodically send a proof of life message via the transmitter.
 2. The vehicle locating unit of claim 1 in which the proof of life message includes a unique vehicle locating unit identification code.
 3. The vehicle locating unit of claim 2 in which the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle.
 4. The vehicle locating unit of claim 3 further including a signal strength determining subsystem for determining the communication source with the strongest signal transmitted to the receiver.
 5. The vehicle locating unit of claim 1 in which the transmitter transmits the proof of life message to the network of communication sources.

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6. A method of servicing failed vehicle locating units, the method comprising:
 - configuring the vehicle locating unit to periodically send a message to one or more remote communication sources;
 - logging said message in a database; and
 - servicing said vehicle locating unit if said message is not received.
7. The method of claim 6 in which the message includes a unique vehicle locating unit identification code and an identification code of a communication source transmitting the strongest signal to the vehicle locating unit to approximate the position of the vehicle locating unit.
8. A method of operating a vehicle locating unit, the method comprising:
 - receiving signals from a network of communication sources;
 - activating a transponder when a communication source sends a message to vehicle locating unit; and
 - periodically sending a proof of life message to the communication sources.
9. The method of claim 8 in which the proof of life message includes a unique vehicle locating unit identification code.

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REPLACEMENT PAGE 11

10. The method of claim 9 in which the proof of life message further includes an identification code of a communication source transmitting the strongest signal to the receiver to approximate the position of the vehicle.

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Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US2006/018962

International filing date: 17 May 2006 (17.05.2006)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 11/131,848
Filing date: 18 May 2005 (18.05.2005)

Date of receipt at the International Bureau: 17 July 2006 (17.07.2006)

Remark: Priority document submitted or transmitted to the International Bureau in
compliance with Rule 17.1(a) or (b)

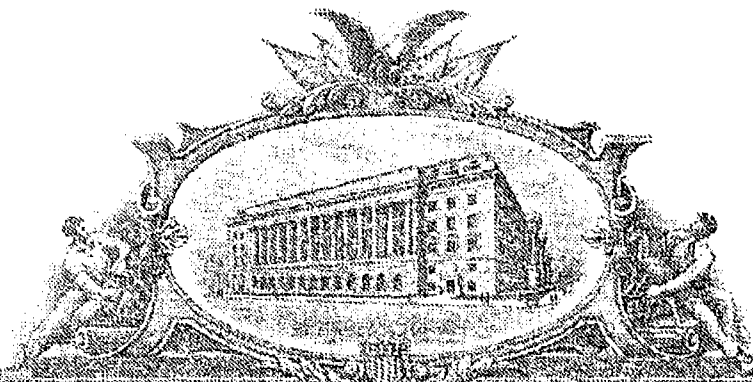


World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

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THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office

July 07, 2006

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: 11/131,848
FILING DATE: May 18, 2005
RELATED PCT APPLICATION NUMBER: PCT/US06/18962

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US11/131,848



Certified by

Don W. Duckert

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
Patent and Trademark Office

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ASSIGNMENT

For valuable consideration, we, Frank Romano, residing at 6 Jasper Street, Westborough, MA 01581; Sampath Krishna, residing at 115 Main Street, Winchester, MA 01890; Son Nguyen, residing at 44 Pembroke St., Marlborough, MA 01752; and Jesse Rhodes, residing at 291 Prospect St., Franklin, MA 02038, (hereinafter "the Assignors"), hereby assign to LoJack Operating Company LP, a Delaware corporation having its principal place of business at 200 Lowder Brook Drive, Westwood, MA 02090, and its successors and assigns (collectively hereinafter called "the Assignee"), the entire right, title and interest throughout the world in the inventions and improvements which are the subject of an application for United States Patent filed on even date herewith entitled

VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD

this assignment including said United States patent and any and all foreign patents granted for said inventions or improvements; and we agree for ourselves and our heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, preliminary statements and other lawful documents as the Assignee may reasonably request to effectuate fully this assignment.

In Witness Whereof, we hereto set our hands and seal at Canton
(city, town)
this 30th day of March, 2005.

Frank Romano
Frank Romano

Son Nguyen
Son Nguyen

Sampath Krishna
Sampath Krishna

Jesse Rhodes
Jesse Rhodes

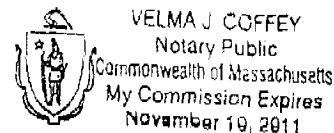
Commonwealth of Mass
County of Hampshire

Before me this 30th day of March, 2005, personally appeared Frank Romano, proved to me through satisfactory evidence of identification, which were LIC - MA, Sampath Krishna, proved to me through satisfactory evidence of identification, which were LIC - MA, Son Nguyen, proved to me through satisfactory evidence of identification, which were LIC - MA, and Jesse Rhodes, proved to me through satisfactory evidence of identification, which were LIC - MA, to be the persons whose names are subscribed to the foregoing assignment and acknowledged that they executed the same as their free act and deed for the purposes therein contained.

[Notary's
seal here]

Velma J Coffey
Notary Public
My commission expires:

LOJACK-115J
KT/ok



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ASSIGNMENT

For valuable consideration, we, Philip Grahame Crewe, residing at 3 Granta Vale, Linton, Cambridgeshire, CB1 6LB; Daniel Jonathan Finchley Cletheroe, residing at Flat 4 Granthams Court, De Freville Road, Great Shelford, Cambridge, CB2 5LH; Mark Marsden, residing at 38 Lambert Cross, Saffron Walden, Essex, CB10 2DP; Steven Walter Greendale, residing at 15 Bosworth Road, Cambridge, CB1 8RG; Nigel James Watson, residing at 14 Mill Lane, Whittlesford, Cambridgeshire, CB2 4NE; Ian Christopher Stroud, residing at "Knotty Oak", Frambury Lane, Newport, Essex, CB11 3PY; Timothy David Howe, residing at 76 Birch Trees Road, Great Shelford, Cambridgeshire, CB2 5AW; and Gerard Edward Smith, residing at 21 Standrums, Great Dunmow, Essex, CM6 1TY, (hereinafter "the Assignors"), hereby assign to LoJack Operating Company LP, a Delaware corporation having its principal place of business at 200 Lowder Brook Drive, Westwood, MA 02090, and its successors and assigns (collectively hereinafter called "the Assignee"), the entire right, title and interest throughout the world in the inventions and improvements which are the subject of an application for United States Patent filed on even date herewith entitled

VEHICLE LOCATING UNIT PROOF OF LIFE SUBSYSTEM AND METHOD

this assignment including said United States patent and any and all foreign patents granted for said inventions or improvements; and we agree for ourselves and our heirs, legal representatives and assigns, without further compensation to perform such lawful acts and to sign such further applications, assignments, preliminary statements and other lawful documents as the Assignee may reasonably request to effectuate fully this assignment.

In Witness Whereof, we hereto set our hands and seals at GREAT CHESTER FORD, UK
(city, town)

this 17th day of APRIL, 2005.

Philip Grahame Crewe
Philip Grahame Crewe

Mark Marsden
Mark Marsden

Nigel James Watson
Nigel James Watson

Timothy David Howe
Timothy David Howe

Witness: David Cox
Signature

Print Name: DAVID COX

Date: 17/4/05

LOJACK-115J
KT/ok

Daniel Jonathan Finchley Cletheroe
Daniel Jonathan Finchley Cletheroe

Steven Walter Greendale
Steven Walter Greendale

Ian Christopher Stroud
Ian Christopher Stroud

Gerard Edward Smith
Gerard Edward Smith

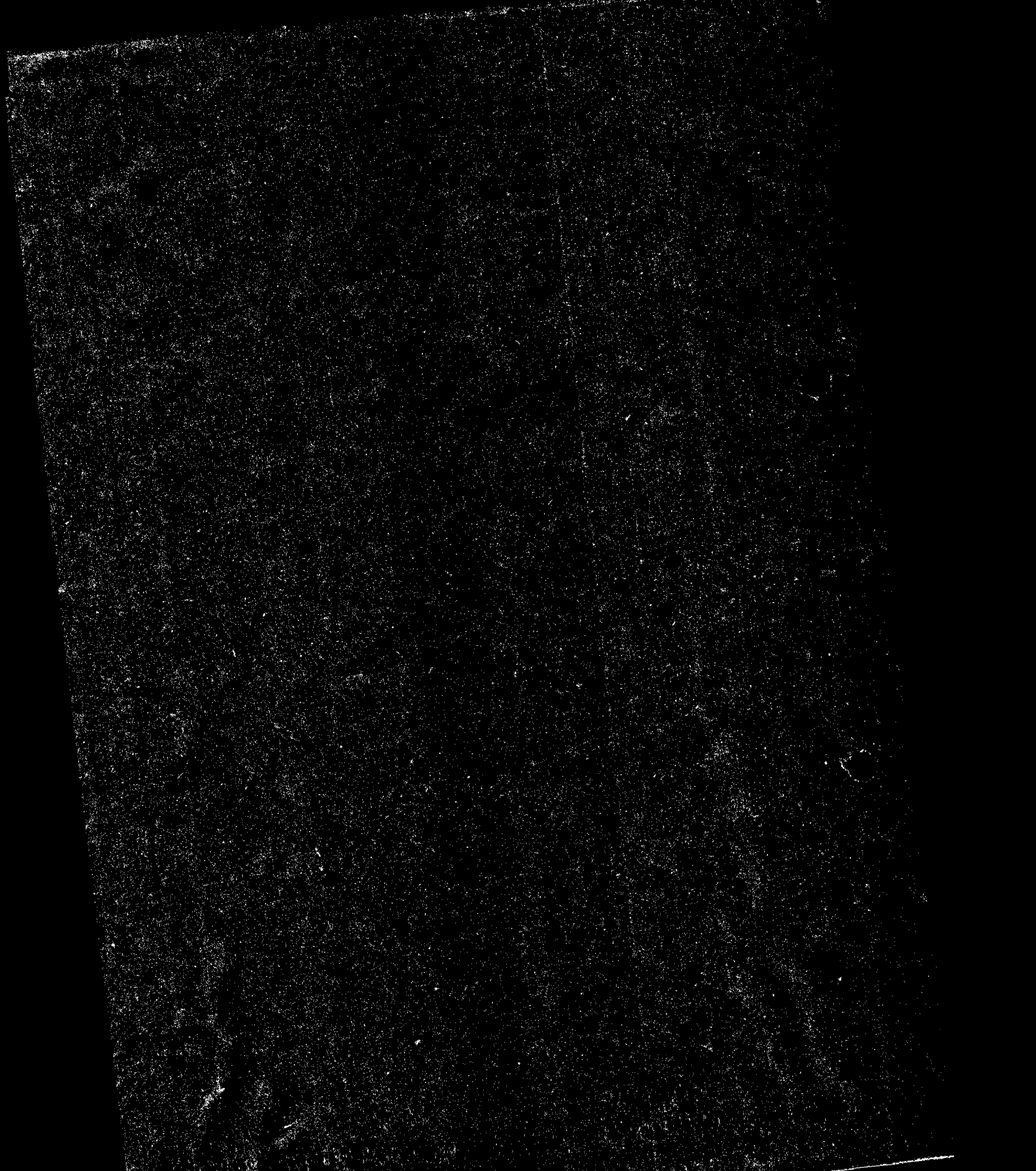
Witness: Janice Nicole
Signature

Print Name: JANICE NICOLE

Date: 17/4/05

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Tra. 11 PATENTE IYII Eve: 379 FASE NACIONAL II
Act. 411 PRESENTACION Folios: 78

SUPERINTENDENCIA

REQUISITOS MINIMOS PARA ADMISION A TRAMITE PCT

PATENTE DE INVENCION

[]

MODELO DE UTILIDAD

[]

- ◆ Indicación de que se solicita la concesión de una patente []
- ◆ Datos de identificación del solicitante o de la persona que presenta la solicitud []
- ◆ Descripción de la invención []
- ◆ Dibujos de ser estos pertinentes []
- ◆ Comprobante de pago de las tasas establecidas []

COMPLETA []

INCOMPLETA []

DISEÑO INDUSTRIAL

[]

- ◆ Indicación de que se solicita el registro de Diseño Industrial []
- ◆ Datos de identificación del solicitante o de la persona que presenta la solicitud []
- ◆ Representación gráfica y fotográfica del Diseño Industrial o muestra del material que incorpora el diseño []
- ◆ Comprobante de pago de las tasas establecidas []

COMPLETA []

INCOMPLETA []

ESQUEMA DE TRAZADO

[]

- ◆ Indicación de que se solicita el registro de un Esquema de Trazado []
- ◆ Datos de identificación del solicitante o de la persona que presenta la solicitud []
- ◆ Representación gráfica del esquema trazado []
- ◆ Comprobante de pago de las tasas establecidas []

COMPLETA []

INCOMPLETA []

Felipe Navarro
Firma Responsable

Fecha 19 NOV. 2007

Carrera 13 No. 27-00 Piso 5, 7 y 10
Conmutador: 3 82 08 40
Fax: 350 52 20
E-mail: info@sic.gov.co
www.sic.gov.co
Bogotá, D.C., Colombia

80 80

REPUBLICA DE COLOMBIA
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Bogotá,
2020

Doctor(a)
RODRIGUEZ D ALEMAN DILIA MARIA

REFERENCIA	Radicación No.	07 121818
	Solicitud internacional	PCT/US2006/018962
	Fecha inicio fase nacional	18/12/2007
	Trámite	11
	Evento	379
	Actuación	430
	Oficio No.	

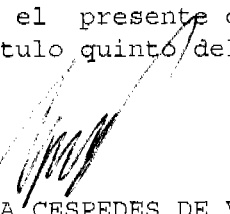
- 818

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

1. Si fuere el caso, el solicitante debe adjuntar la traducción de los anexos del reporte de examen preliminar internacional (Art. 36.2.b) del tratado PCT.
2. La solicitud no contiene la copia del documento en que consta la cesión del derecho a la patente del inventor al solicitante o a su causante. (Art. 26-k) Decisión 486.
3. La solicitud no contiene el poder debidamente otorgado, con el lleno de los requisitos exigidos por los artículos 63 y subsiguientes del Código de Procedimiento Civil. Adicionalmente, deberá presentar el documento que acredita la existencia y representación legal de la sociedad solicitante, cuando ésta fuere persona jurídica.

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

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


ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la división de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista de fecha 25 ENE 2010
jfernand