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Washington DC 20231

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PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 C.F.R. 1.53 (b) (2).

Docket Number	1383.041PRV	Type a plus sign (+) inside this box >	+

INVENTOR(s)/APPLICANT(s)

Name (last, first, middle initial)	RESIDENCE (CITY, AND EITHER STATE OR FOREIGN COUNTRY)
Menard, Raymond J.	Hastings, Minnesota

TITLE OF THE INVENTION (280 characters max)

VARIABLE DISTANCE RF TAG DISCLOSURE

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STATE	Minnesota	ZIP CODE	55402	COUNTRY	United States of America

ENCLOSED APPLICATION PARTS (check all that apply)

XXX	Specification	Number of Pages	3		Small Entity Statement
	Drawing(s)	Number of Sheets			Other (specify)

METHOD OF PAYMENT (check one)

XXX	A check or money order is enclosed to cover the Provisional filing fees	PROVISIONAL FILING FEE AMOUNT	$150.00
XXX	The Commissioner is hereby authorized to charge any additional required fees or credit overpayment to Deposit Account Number: 19-0743		

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

XXX No.

___ Yes, the name of the U S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE D.W. Black Date March 28, 2001

TYPED OR PRINTED NAME David W. Black REGISTRATION NO. 42,331

___ Additional inventors are being named on separately numbered sheets attached hereto.

PROVISIONAL APPLICATION FILING ONLY

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re **PROVISIONAL** Patent Application of: Raymond J. Menard

Title: VARIABLE DISTANCE RF TAG DISCLOSURE

Docket No.: 1383.041PRV

BOX PROVISIONAL APPLICATION
Commissioner for Patents
Washington, D.C. 20231

We are transmitting herewith the following attached items (as indicated with an "X"):

X A PROVISIONAL Patent Application comprising:
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X Provisional Application Cover Sheet (1 page).
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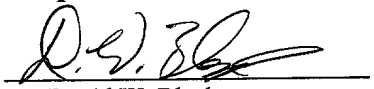
By: 
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Variable Distance RF Tag Disclosure

Introduction

Disclosed herein is a first device, or radio frequency (RF) tag, that can be attached to an object, person or animal to provide information as to the distance between the first device and a second (or home) device. When the distance between the first and second device exceeds a predetermined distance (a specific range), then an alarm is triggered at the second device. The alarm may be an audible alarm. In one embodiment, the second device provides information relative to the location of the first device. The information may include directional and distance information which may assist in locating the object, person or animal carrying the first device. It is believed that this technology may be of benefit in tracking luggage, pets, and people in a public location, such as a shopping mall. In one embodiment, the system uses a radio frequency transmission for monitoring a linear distance between two devices. The first device is a portable module and the second device may be either a portable or stationary module.

In one embodiment, the first device includes a battery operated transmitter with a microprocessor. The transmitter broadcasts a signature which varies as a function of the distance from the device. In one embodiment, the first device includes a range setting control which allows the distance to be calibrated. In one embodiment, the first device includes a transceiver.

In one embodiment, the second device may be coupled to a portable communication device such as a pager, a cellular telephone, a personal digital assistant or other communication device. In one embodiment, the second device may be line powered. The second device includes a receiver coupled to a microprocessor. The second device includes a display, speaker, or vibratory mechanism to indicate that a particular predetermined range has been exceeded.

Various means can be employed to determine the distance between the first and second device, including:

a) range determined on the basis of signal strength. Signal strength drops as the cube of the distance and can be used to determine the range.

b) range determined using discrete global position information (GPS) modules. Each device includes a GPS receiver and in one or both devices, a calculation is performed to determine the range between the devices.

c) range determined using timing differences (each device has transceiver). A clock signal is used to determine the distance between each device. For example, a clock operating in one device is monitored while a signal is exchanged between the first and second device. Relative distance is based on the elapsed transit time for the signal.

In one embodiment, the first device is affixed to, or carried by, a first object or first person and the second device is affixed to, a second object or second person. The distance between the first and second objects is then monitored and displayed or annunciated, at the second object or to the second person. In one embodiment, if the distance exceeds a predetermined value, then an audible, vibratory, or visual message is presented using the second device.

The first device may be attached to, or carried by, an object, person or animal. The first device includes a short range transmitter compatible with a protocol such as HomeRF™, Bluetooth™, or the Institute of Electrical and Electronics Engineers, Inc., (IEEE) 802.15 WPAN standard. In one embodiment, the transmitter is linked to a communication network, such as a

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pager network or cellular network.

BLUETOOTH® is a trademark registered by Telefonaktiebolaget LM Ericsson of Stockholm, Sweden and refers to technology developed by an industry consortium known as the BLUETOOTH® Special Interest Group. BLUETOOTH® operates at a frequency of approximately 2.45 GHz, utilizes a frequency hopping (on a plurality of frequencies) spread spectrum scheme, and provides a digital data transfer rate of approximately 1Mb/second. In one embodiment, the present system includes a transceiver in compliance with BLUETOOTH® technical specification version 1.0, herein incorporated by reference.

In one embodiment, the present system includes a transceiver in compliance with standards established, or anticipated to be established, by the Institute of Electrical and Electronics Engineers, Inc., (IEEE). The IEEE 802.15 WPAN standard is anticipated to include the technology developed by the BLUETOOTH® Special Interest Group. WPAN refers to Wireless Personal Area Networks. The IEEE 802.15 WPAN standard is expected to define a standard for wireless communications within a personal operating space (POS) which encircles a person.

In one embodiment, the transceiver is a wireless, bidirectional, transceiver suitable for short range, omnidirectional communication that allows ad hoc networking of multiple transceivers for purposes of extending the effective range of communication. Ad hoc networking refers to the ability of one transceiver to automatically detect and establish a digital communication link with another transceiver. The resulting network, known as a piconet, enables each transceiver to exchange digital data with the other transceiver. According to one embodiment, BLUETOOTH® involves a wireless transceiver transmitting a digital signal and periodically monitoring a radio frequency for an incoming digital message encoded in a network protocol. The transceiver communicates digital data in the network protocol upon receiving an incoming digital message.

In one embodiment, the first device has a characteristic signature, or identification information, and the second device is responsive to this signature. The second device selectively monitors the distance separating the first and second device. The second device includes a transceiver compatible with the first device. The second device can monitor the RF signal from a single predetermined first device and ignore other devices in the area. The process may include security functions.

In one embodiment, the range at which an alarm is sounded or triggered, that is, the trigger range, may be set manually or automatically. In alternative embodiments, the trigger range may be set using the first device or the second device. In one embodiment, the trigger range is set by physically placing the first device at a desired distance and actuating a button on the device or entering a voice command. The desired distance is then associated with a characteristic signal strength, or other measurable value, which then establishes a perimeter beyond which an alarm is sounded or a trigger signal is generated. If the distance between the first device and the second device exceeds the trigger range, then, in various embodiments, different methods may be executed. For example, in one embodiment, the RF range is increased and communications between the first and second device is reestablished. As another example, in one embodiment, the first device sends location information to the second device. The location information may include range and bearing or GPS coordinates. In one embodiment, an alarm is sounded on the second device showing the location of the first device. The alarm may include a sound, a light, a text message, or a vibratory message. As another example, a network

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connection to a wide, or narrow, area communication network may be used to determine the location of the first device.

In one embodiment, the trigger distance is established by physically moving the first device to the allowed perimeter distance and adjusting the signal transmission strength of the transmitter or the sensitivity of the receiver until a predetermined level is reached which then generates an alarm at the second device. Alternatively, preset signal strengths associated with various distances can be used. In various embodiments, either the receiver or the transmitter is adjusted.

In one embodiment, when the devices indicate that the trigger range has been exceeded then the transmitter output signal is raised. In one embodiment, the RF range is not at the maximum at the perimeter of the range.

The second device, or home device, may include a cell phone, a personal digital assistant (PDA) or pager and equipped with a transmitter compatible with HomeRF™, Bluetooth™, or IEEE 802.15 WPAN.

Similar principles may be used to track items, objects, or persons that are normally out-of-range and that move into RF range. For example, two people in a dense crowd can locate each other using the present technology. If each person carries a Bluetooth™- equipped telephone, then this technology allows free voice or data communication between the telephones rather than cellular network-based communications.

Representative claims and statement of the invention:

1. A system comprising:
a portable device having a first transceiver;
a second device having a second transceiver compatible with the first transceiver;
distance determining means adapted for determining a linear distance between the portable device and the second device;
alarm means coupled to the second device; and
comparison means coupled to the second device and adapted for receiving the linear distance and activating the alarm means if the linear distance exceeds a predetermined value.

2. A method comprising:
establishing a digital communication channel between a portable wireless device and a second wireless device;
comparing the linear distance between the portable wireless device and the second wireless device with a predetermined value; and
generating an alarm at the second wireless device if the linear distance exceeds the predetermined value.

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