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(54) **DUAL RANGE VEHICLE REMOTE**

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(57) **ABSTRACT**

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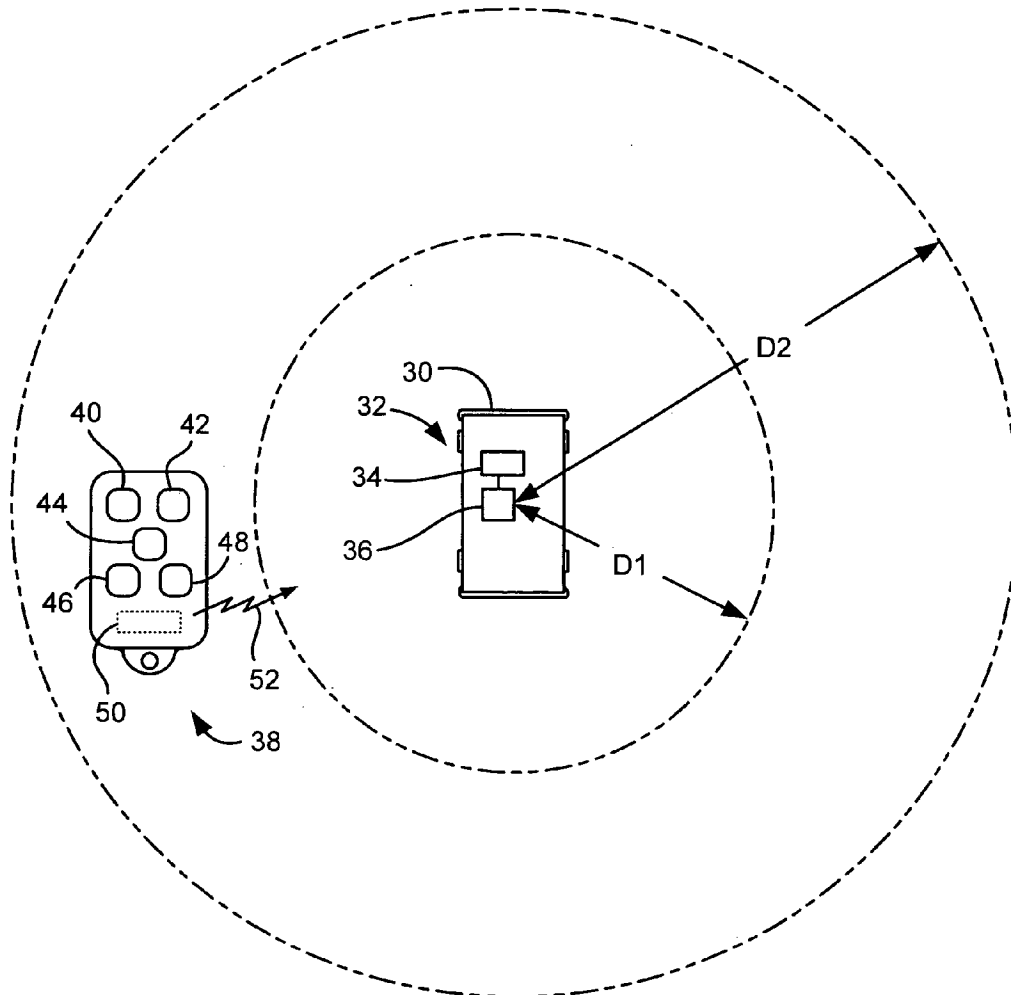
A method and system are disclosed for operating a controller of and a RKE system to provide for short distance functions that are actuatable from a key fob at a shorter distance from the vehicle than other long distance functions. This may include receiving a desired type of radio frequency signal; actuating a high gain mode of a receiver of the controller; detecting a message from an acceptable remote keyless entry transmitter; decoding a function code portion of the message; changing the receiver from the high gain mode to a lower gain mode if the function code is not a long distance function; decoding a remaining portion of the message; determining if the remaining portion of the message was decoded properly; and performing the requested function if the remaining portion of the message was decoded properly.

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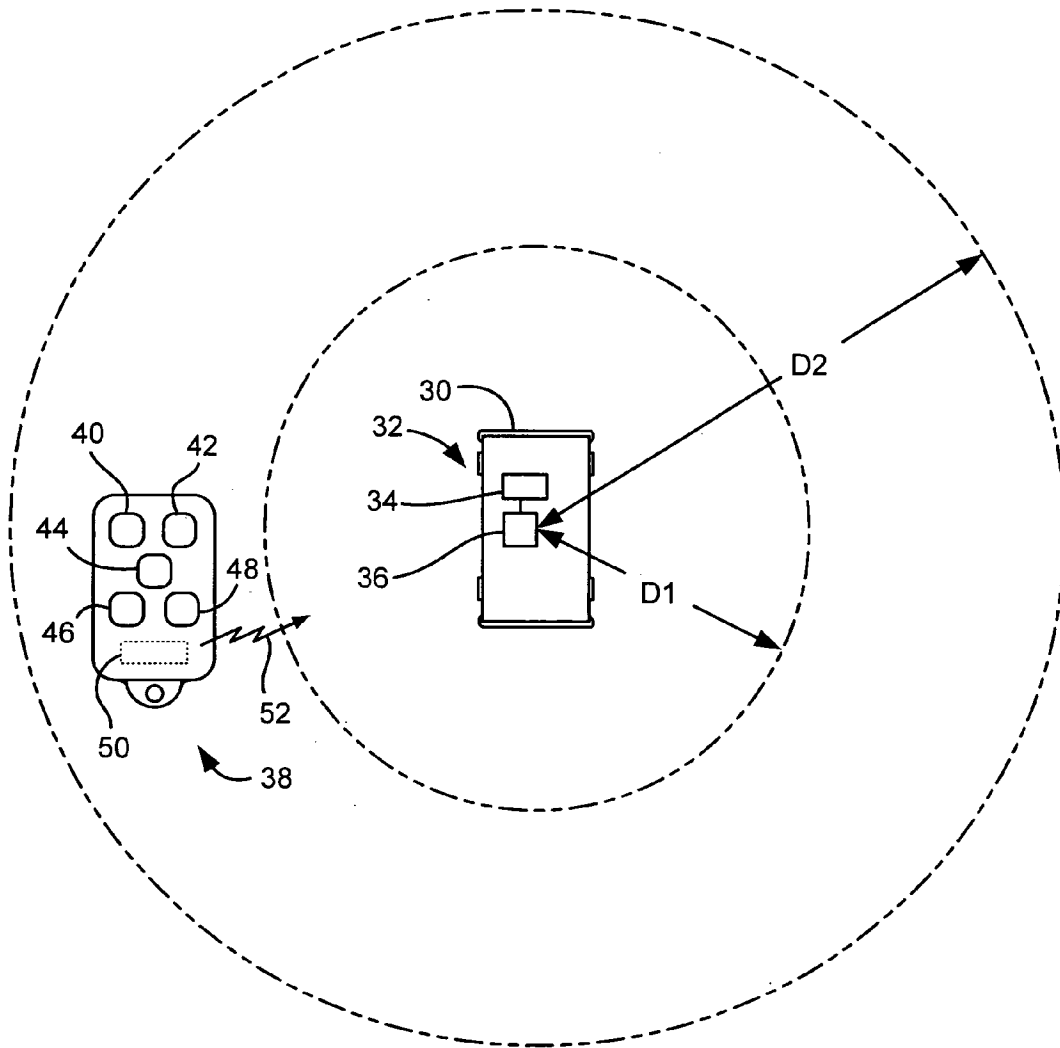


Fig. 1

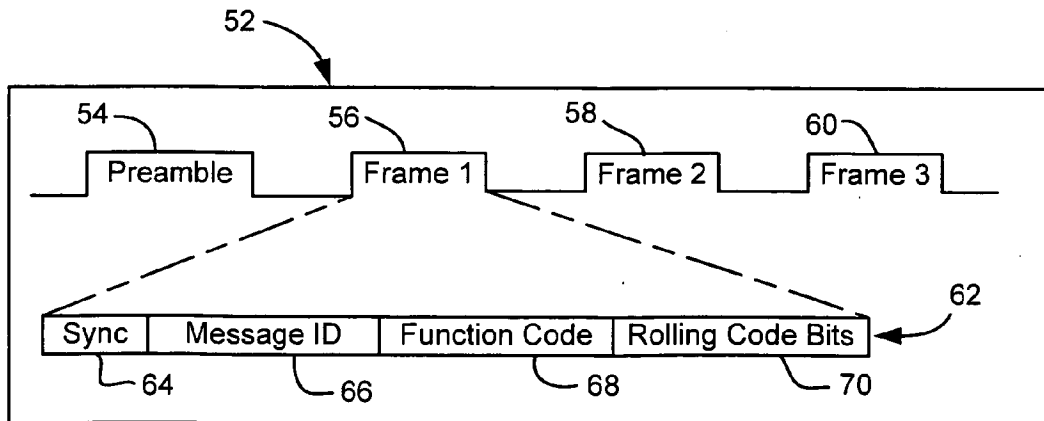


Fig. 2

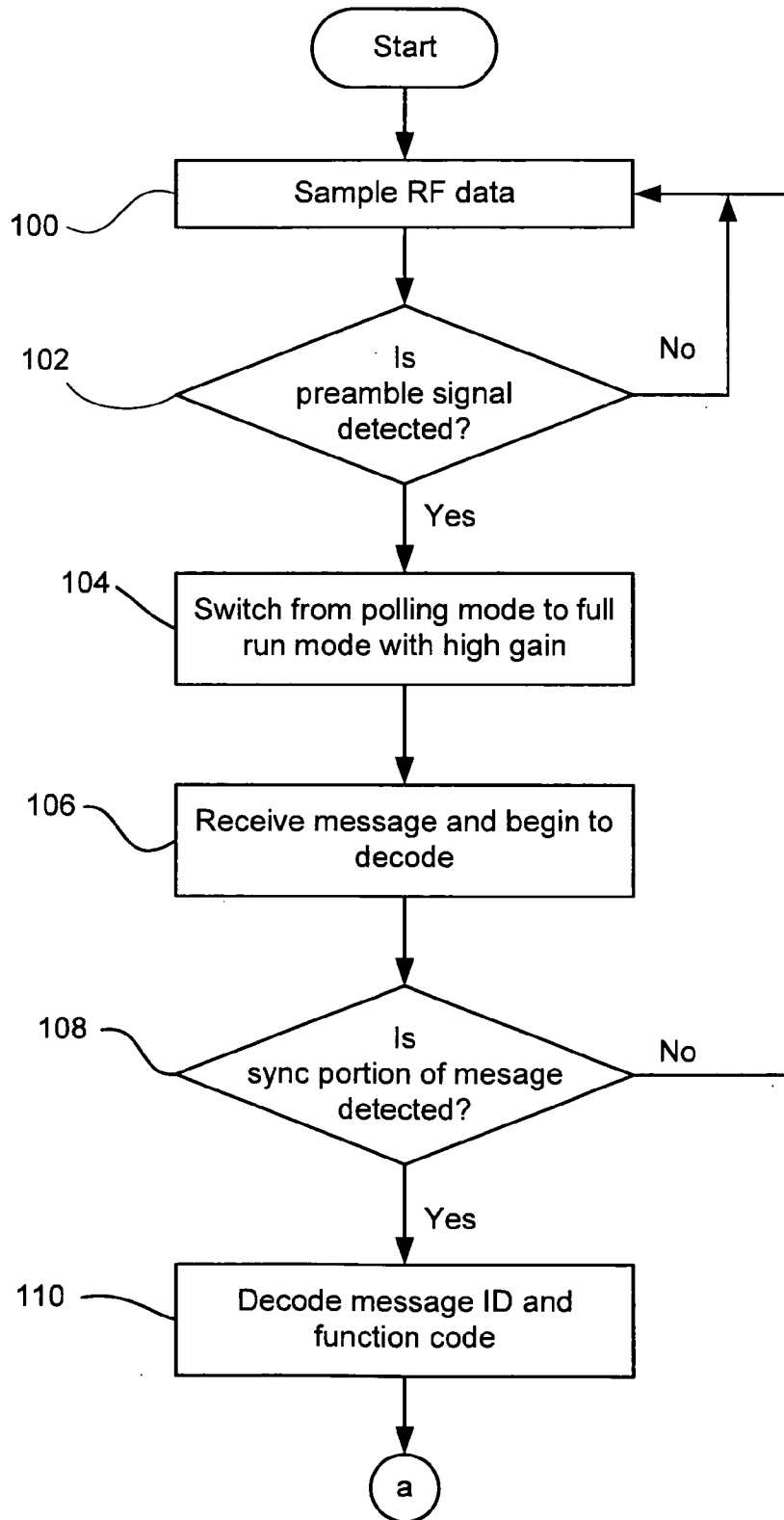


Fig. 3A

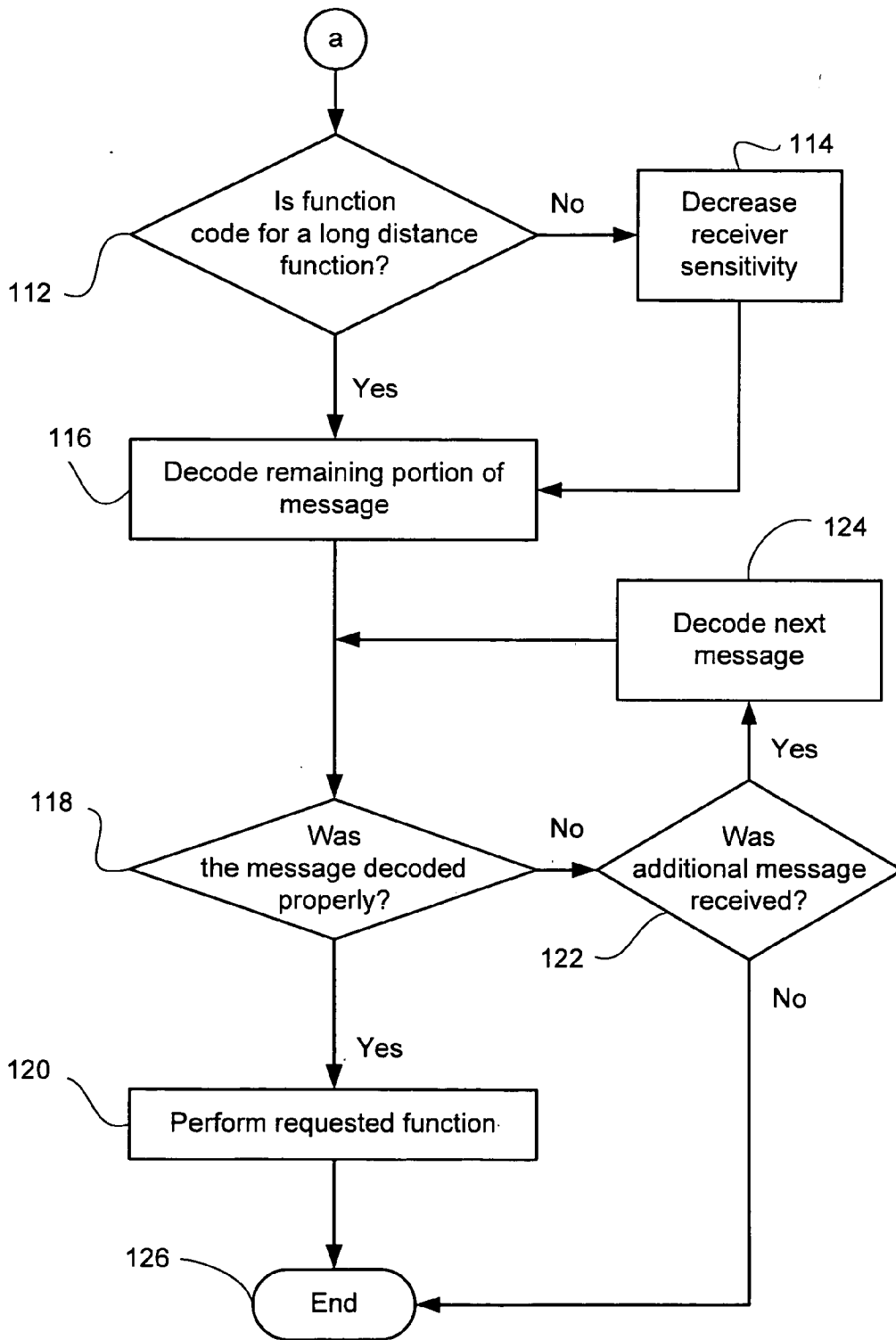


Fig. 3B

DUAL RANGE VEHICLE REMOTE

BACKGROUND OF INVENTION

[0001] The present invention relates to remote keyless entry types of systems employed with automotive vehicles.

[0002] Remote keyless entry systems are commonly used with automotive vehicles today. Such systems are including a wider range of functions that can be performed by the remote keyless entry system. For example, not only are the conventional lock, unlock, trunk release, and panic functions available, but also new functions such as remote engine start.

[0003] For certain functions, such as remote engine start, it is desirable to allow these functions to be performed while the operator is a greater distance from the vehicle than for some of the conventional functions. For example, one may wish to allow for the remote engine start, door lock, and panic alarm functions to be operable when the key fob is as far away from the vehicle as two hundred meters. To obtain this long range functionality, the remote keyless entry system can be designed to operate at this greater distance.

[0004] Having the greater range of operation for the remote keyless entry system, however, may be undesirable for certain other remote keyless entry functions. One may wish to avoid inadvertently releasing the trunk if the trunk release button on the key fob is pressed when one is at this long range distance since he will not see or hear the trunk release. Moreover, one may not wish to inadvertently unlock the vehicle doors when at this longer range since one may be out of sight of the vehicle and thus not realize that the doors are unlocked. Accordingly, it may be undesirable for door unlock or trunk release functions to be operable from the same two hundred meter distance. Of course, the shorter range functions are still desirable for the remote keyless entry system, so operators may wish for these short-range functions to be operable only when the operator actuates the key fob at a more conventional range of, for example, about fifty meters or less.

[0005] Some have attempted to overcome this drawback by designing their remote keyless entry systems to try and detect the distance that the key fob is from the vehicle when the button is pressed, and then determine what function, if any, to perform based on this detected distance. This may be attempted by using received signal strength indicator (RSSI) circuitry. But due to environmental conditions, such as ambient radio frequency noise, this type of method can be very unrepeatable—that is, the range is not always consistently and accurately determined. Such inaccuracy may be undesirable for vehicle operators with these types of remote keyless entry systems. Thus, it is desirable to have a remote keyless entry system that allows for operation of both long-range and short-range functions, while overcoming the drawbacks of the prior art.

SUMMARY OF INVENTION

[0006] An embodiment of the present invention contemplates a method of operating a controller of a remote keyless entry system in a vehicle comprising the steps of: receiving a desired type of radio frequency signal; actuating a high

ter; decoding a function code portion of the message; changing the receiver from the high gain mode to a lower gain mode if the function code is not a long distance function; decoding a remaining portion of the message; determining if the remaining portion of the message was decoded properly; and performing the requested function if the remaining portion of the message was decoded properly.

[0007] An embodiment of the present invention also contemplates a method of determining whether to perform a remotely requested vehicle function transmitted via an RF signal from a remote transmitter to a vehicle, the method comprising the steps of: actuating a button on the remote transmitter within a predetermined distance from the vehicle to cause the transmission of the RF signal, with the RF signal having a preamble portion and a message portion; receiving the RF signal with a RKE system in the vehicle; actuating a high gain mode of the RKE system; determining whether the remotely requested vehicle function in the message portion is a short distance function; changing the receiver to a lower gain mode if the remotely requested vehicle function is the short distance function; decoding a remaining portion of the message portion; and performing the remotely requested vehicle function if the remaining portion of the message portion is decoded properly.

[0008] An embodiment of the present invention further contemplates a dual range vehicle remote that includes a key fob and a remote keyless entry (RKE) system. The key fob includes a plurality of buttons, each adapted for indicating a desired remote function, and a transmitter capable of transmitting a signal having a message portion indicative of the desired function when one of the plurality of buttons is actuated. The RKE system may include a receiver capable of receiving the signal, and a controller for setting the RKE system in high gain mode, determining if the desired function in the message portion is a short distance function, changing the RKE system to a lower gain mode if the desired function is a short distance function, decoding a remaining portion of the message portion, and performing the desired function if the remaining portion of the message portion is decoded properly.

[0009] An advantage of an embodiment of the present invention is that, for certain remote keyless entry functions where it is desirable to operate from a long distance, these functions may operate at these longer distances, while other short distance functions are disabled at such long distances. Thus, inadvertent actuation of short distance functions from a long distance can be avoided.

[0010] A further advantage of an embodiment of the present invention is that the ability to disable the short distance functions when the key fob is at a long distance may be performed in a consistent and repeatable manner.

[0011] An additional advantage of an embodiment of the present invention is that no received signal strength indicator (RSSI) or other distance calculating technology is required in the operation of this invention.

BRIEF DESCRIPTION OF DRAWINGS

[0012] FIG. 1 is a schematic representation of the vehicle and remote keyless entry system, and the ranges at which the

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