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[54] **REMOTELY ACTIVATED AUTOMOBILE DISABLING SYSTEM**

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[52] **U.S. Cl.** **379/58;** 379/59; 70/243; 180/287; 307/10.3; 307/10.5; 340/426; 340/539; 455/54.2

[58] **Field of Search** 379/56, 58, 59, 37, 379/39, 42, 44; 70/243, 654; 340/539, 426, 429; 180/167, 169, 287; 307/10.3, 10.5, 10.4; 455/54.2

[56] **References Cited**

OTHER PUBLICATIONS

Radio Shack, 1988 Catalog, pp. 63 and 115.
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[57] **ABSTRACT**

A system for remotely disabling or enabling an automobile having at least one receiver that scans signal codes transmitted in frequencies dedicated to mobile telephone communications, and at least one frequency outside that used in mobile telephone communications. The signal codes received by the receiver are compared to an enabling code and a disabling code stored within a programmable memory. When the owner of an automo-

[redacted]

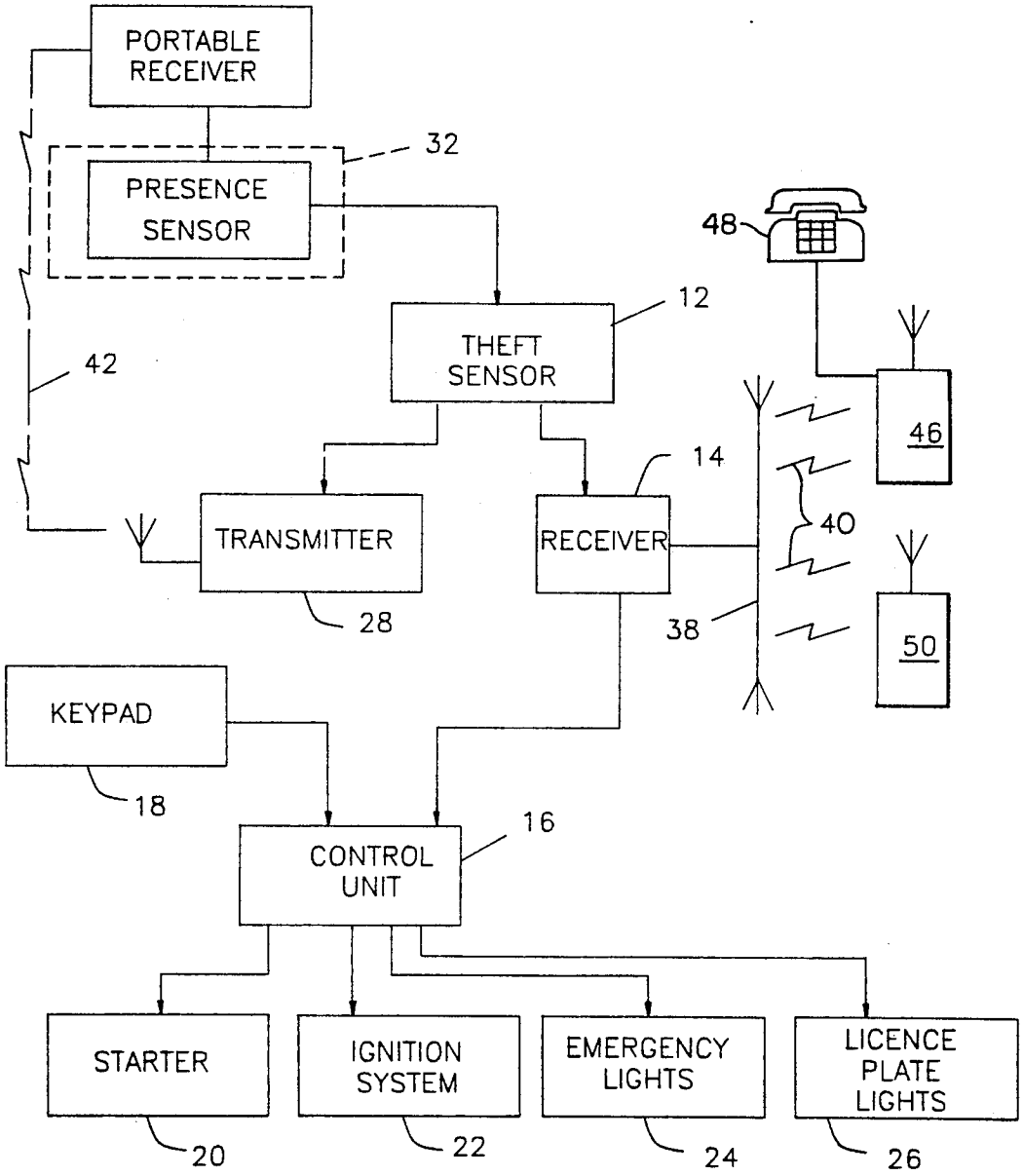

FIG. 1

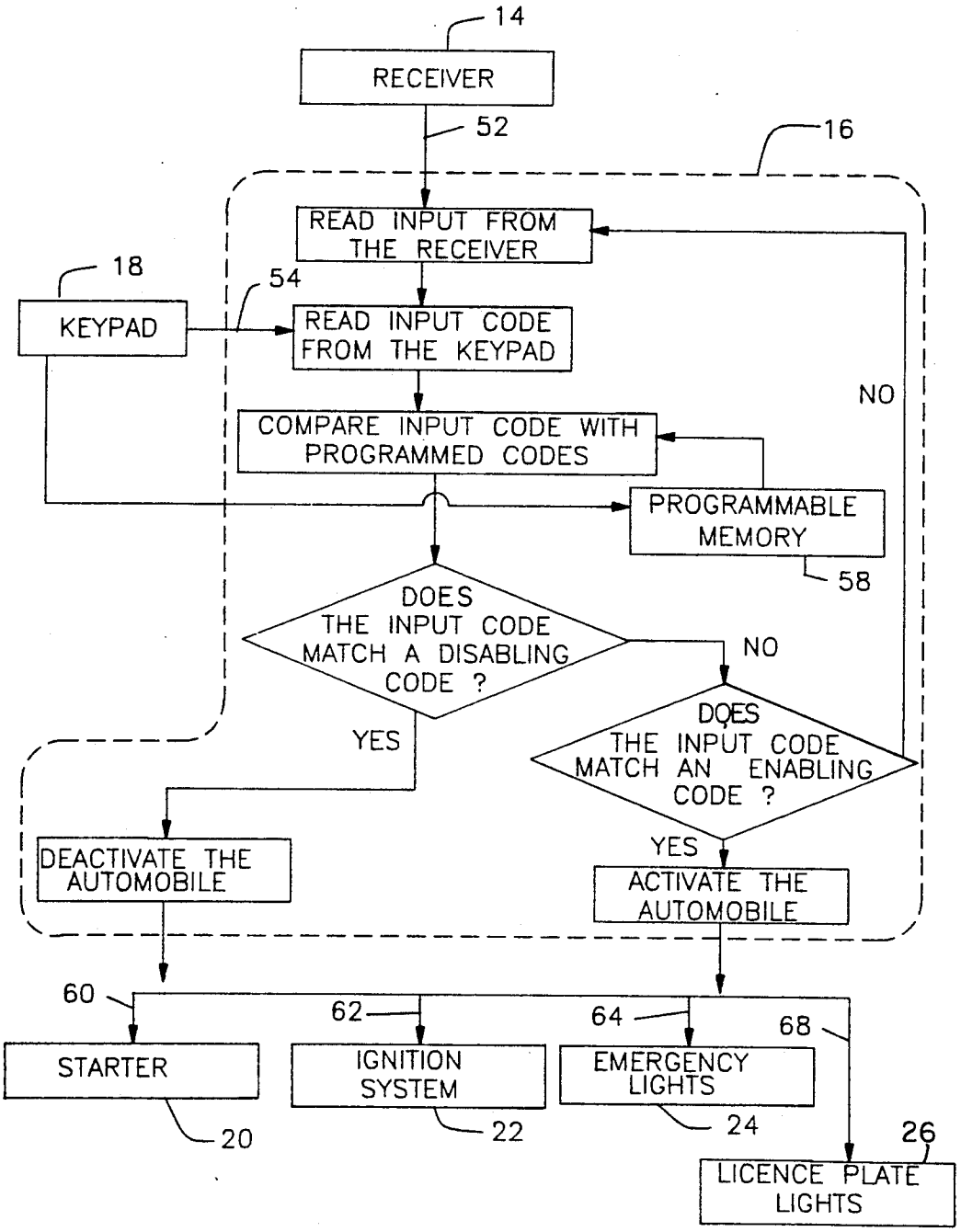

FIG. 2

REMOTELY ACTIVATED AUTOMOBILE DISABLING SYSTEM

FIELD OF THE INVENTION

The present invention relates to remotely operated system for disabling an automobile, and more particularly to such systems that allow either the owner of a vehicle or the police to selectively disable a vehicle after it has been stolen or otherwise misappropriated.

BACKGROUND OF THE INVENTION

Automobile theft is a very common crime, resulting in higher automobile insurance rates for all drivers. Each year newer and more sophisticated anti-theft devices are manufactured in the hope that these devices will prevent the theft of some automobiles. Unfortunately, automobile thieves adapt quickly. No sooner has a new anti-theft device been developed, than an automobile thief has thought of a way to disable or circumvent the anti-theft device and steal the automobile.

Many stolen automobiles are stolen for profit, wherein the automobiles are sold by the thieves or the automobile is stripped of its valuable component parts. However, some automobiles are stolen for alternative motives such as "joy riding" or the automobile may be used in the commission of another crime.

When an automobile is stolen, the owner of the vehicle usually reports the theft to police. The description of the automobile and its license plate number are then identified in the police records as being a stolen vehicle. Often police locate the stolen vehicle while it is still in the possession of the automobiles thieves. If the automobile is being driven when it is identified by police, the thieves may try to outrun the pursuant police, resulting in a dangerous high speed chase.

The present invention system helps to both prevent automobile thefts and prevent high speed chases by allowing both the owner of the automobile and the police to disable the automobile remotely after it is stolen. Since the disabling device is not activated until after the car is stolen, thieves do not know that the disabling device is present and do not attempt to disconnect the system when they are stealing the automobile. After an automobile is stolen the owner may not realize that his/her automobile has been stolen until the automobile is many miles away. The present invention system utilized mobile telephone technology to deactivate the stolen automobile. With such a system the owner of the car need only dial the disabling code for the automobile into a phone and the code will be transmitted to all points within the mobile telephone cellular region, which may encompass hundreds of square miles. If the automobile is first found by police, the police may disable the automobile by dialing the same disabling code into a telephone. Alternatively, the police may also transmit the disabling code from small transmitters carried in the police cars. This would allow the police to selectively disable a car, involved in a high speed chase, at a point most opportune to prevent injury and/or property damage.

Remote controlled devices that disable an automobile are in common use. The most typical device is incorporated into an alarm system, wherein the owner of the vehicle has a low power, short range transmitter that disables the car and activates an alarm. Such systems are exemplified in U.S. Pat. Nos. 4,691,801 to Mann, et al.; 4,159,467 to Ballin; 3,987,408 to Sassover, et al.; and 4,740,775 to Price. With all of these devices the thief will know the car is disabled as the thief is stealing the car, giving the thief an opportunity to circumvent the device.

High powered, long distance disabling devices that do not disable an automobile until after it is stolen are exemplified in U.S. Pat. No. 4,067,411 to Conley, et al. In such device the automobile that has been stolen responds to a signal transmitted from a central transmitter. The automobile then disables itself if it is in the range of the transmitter. With such disabling systems the range is limited and the individual owner cannot disable the automobile. Similarly, the police must also use the central transmitter and cannot selectively disable the automobile at will.

Many anti-theft devices also place transmitters into automobiles. With such a system, the automobile can remotely alert the owner that the automobile is being stolen, or may transmit a signal so that the police may locate the automobile. Examples of such systems are shown in U.S. Pat. Nos. 4,673,921 to Saito et al; 4,523,178 to Fulhorst; 4,218,763 to Kelly et al; 3,665,312 to Jarvis: and 3,646,515 to Vodehnal. With such transmitting devices the owner or police can track the location of a stolen vehicle but cannot selectively disable the car at an unknown location.

It is therefore an object of the present invention to create a remotely activated automobile disabling device wherein an owner of a vehicle can dial a disabling code into a telephone and disable the vehicle at any point within the range of a mobile telephone network. Additionally, the police can selectively transmit the disabling code from transmitters within their squad cars, disabling stolen cars that may be involved in the commission of a crime or a high speed chase.

SUMMARY OF THE INVENTION

The present invention system provides a system through which a stolen, or otherwise misappropriated, vehicle ca be remotely disabled by either its owner or the police. Stated in general terms, the present invention includes a receiver that is activated by theft detection sensors when the automobile is stolen. Once activated the receiver monitors the signal frequency range currently used to transmit mobile telephone communications. Once the owner of the automobile discovers that the automobile has been stolen, the operator dials a predetermined telephone number corresponding to the receiver. The number is then transmitted from the signal towers of the mobile telephone network in use. The receiver receives the transmitted signal and compares it to a disabling code and an enabling code stored within the receiver. If the transmitted signal matches the disabling code, the automobile is disabled. Similarly, if the transmitted signal matches the enabling code, a disable automobile will be enabled and can resume normal use.

The enabling and disabling codes can also be transmitted over short distances by portable transmitters carried in police vehicles. The portable transmitters allow the police to selectively disable a vehicle at an opportune moment, if the vehicle is involved in the commission of a crime or a high speed chase. Similarly, the portable transmitters allow police to enable cars that have been disabled in traffic by the owner of the vehicle.

The present invention system optionally comes equipped with a transmitter. The transmitter can signal

a portable receiver, carried by the owner of an automobile, informing the owner that the vehicle is being tampered with or stolen.

BRIEF DESCRIPTION OF THE FIGURES

For a better understanding of the present invention, reference is made to the following description of an exemplary embodiment thereof, considered in connection with the accompanying drawings, in which:

FIG. **1** is a block diagram illustrating the operation of the present invention remote disabling system; and

FIGS. **2** is a block diagram illustrating the operation of the control unit as referenced in FIG. **1**.

DETAILED DESCRIPTION OF THE DRAWINGS

Although the present invention can be used to remotely disable any motor vehicle, such as tractor trailers, motorcycles and the like, it is especially suitable for use in passenger automobiles. Accordingly, the present invention will be described in connection with a passenger automobile.

Most factory equipped automobiles are not manufactured with an integral anti-theft alarm system. However, most passenger automobiles do have certain circuits that can act as theft detection sensors. For example, most automobiles have courtesy lights that light whenever a door of the automobile is opened, or a trunk lamp that lights when the trunk is opened. When an anti-theft alarm system is installed on an automobile, it is common to couple the alarm system to these existing circuits. As such, the courtesy light and trunk lamp switches of an automobile act as anti-theft sensors for the newly installed alarm system. Alarm systems may also add new anti-theft sensors, such as vibration detectors and sound detectors. The combination of existing circuitry and new anti-theft sensors combine to give the greatest theft detecting protection possible to an automobile.

The adaption of anti-theft alarm systems to existing automobile circuits and other tampering detection devices is well known in the art. As such, the circuitry involved in triggering an anti-theft alarm system is not be set forth herein at length. Referring to FIG. **1**, the automobile circuits and other well known devices commonly used to trigger anti-theft alarms are referred to herein as theft sensors **12** and are assumed to be part of the automobile on which the present invention system is to be installed.

With the theft sensors **12** in place, a receiver **14**, control unit **16**, and a means for accessing the control unit **16**, such as a keypad **18**, are added to the automobile. The control unit **16** is coupled to either the electrical circuits or the electromechanical components that selectively control the operation of the starter **20**, ignition system **22** and emergency lights **24**. Optionally, the control unit **16** may also be coupled to an externally visible device such as the lights **26** surrounding the license plate. The controlled activation and deactivation of such electrical circuits and electromechanical components, by a central control unit, is a technology that is well known in the art of automobile anti-theft devices.

Optionally, a transmitter **28** and a portable receiver device **30** may be added to the automobile. The portable receiver device **30** would be located within the automobile so as to be easily accessed and removed by the automobile's operator. Preferably the portable receiver device **30** would be positionable with a receptacle **32**, dedicated within the automobile to hold the portable receiver device **30**. The receptacle **32** has a presence sensor **34** located within it that detects whether the portable receiver device **30** is present within the receptacle **32** or has been removed by the operator of the automobile.

Referring to FIGS. **1** and **2**, the operation of the present invention remote disabling system can be described. When the operator of the automobile is leaving the automobile, the operator removes the portable receiver device **30** from its receptacle **32** and takes the portable receiver device **30** With him or her. The removal of the portable receiver device **30** from the receptacle **32** triggers the presence sensor **34**, which enables the theft sensors **12**. If the portable receiver device **30** were not part of the present invention system, the theft sensors **23** could be enabled from a toggle switch, the removal of the key from the ignition or any other well known means through which automobile alarm systems are activated.

The theft sensors **12** monitor the condition of the automobile. If triggered by theft or tampering, the theft sensor **12** enables the receiver **14**. The receiver **14** is coupled to an antenna **38** so as to receive signal codes **40** from a source external of the automobile. The receiver **14** may take several forms. The receiver **14** may be hidden from view and may be coupled to an antenna **38** that is also hidden from view. Hidden components prevent thieves from disabling the receiver **14** by damaging the receiver **14** itself or the antenna **38** coupled to the receiver **14**. In alternate embodiments the receiver **14** may be part of a mobile telephone that has been previously installed in the automobile. In such an embodiment the receiver **14** would be obvious and be coupled to the antenna **14** dedicated to the mobile telephone. However, thieves would not consider a mobile telephone as an anti-theft device and would not damage either the telephone receiver unit or the antenna because both are valuable commodities to a thief. Regardless, to the embodiment of the receiver **14** and the antenna **38**, the receiver **14** scans the frequency range of mobile telephone transmissions, which is in the range of 900 MHz. The signal codes **40** received by the receiver **14** are forwarded to the control unit **16**.

The theft sensors **12** are optionally coupled to a transmitter **28**. Once activated the transmitter **28** transmits a signal **42** that can be received by the portable receiver device **30**. The portable receiver device **30** then generates an audio and/or visual signal that informs a person in possession of the portable receiver device **30** of the tampering or attempted theft of the automobile.

The receiver **14** can receive a signal code **40** from one of two sources. First, the signal code **40** may come from mobile telephone signal transmitter **46** operating in the area of the automobile. Such mobile telephone signal transmitters **46** are now commonplace in populated areas and are easily accessed. Mobile telephone signal transmitters **46** are often parts of larger mobile telephone networks, often called "cellular networks" that transmit signals across thousands of square miles and many encompass several states. A signal code **40** is transmitted to the receiver **14** as if the receiver **14** were a common mobile telephone unit. The transmission of a dialed code to a specific mobile telephone being a well known technology in the art of telecommunications. To transmit the signal code **40**, a person, by using any telephone **48**, need only dial the phone number of the re-

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