



[54] VEHICLE SECURITY SYSTEM INCLUDING AN ANTI-CARJACKING SYSTEM

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[58] Field of Search 340/426, 425.5, 428, 340/430, 528, 527, 522, 523, 543, 576; 307/10.2, 10.3, 10.4-10.6; 180/287, 271

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Attorney, Agent, or Firm—Banner, Birch, McKie & Beckett

[57] ABSTRACT

A vehicle security system for protecting a vehicle from carjacking and from theft while the vehicle is unattended. The portion of the security system which protects the vehicle from theft while the vehicle is unattended is selectively initiated by pressing a command button on a remote control transmitter. In response thereto, a first disablement sequence is initiated which includes disabling the vehicle. The portion of the security system which protects the vehicle from carjacking is automatically initiated by the starting of the engine. A second disablement sequence is initiated upon either the sensing of a door opening while the engine is running or upon receipt of a signal transmitted by the remote control transmitter. The second disablement sequence provides a warning to persons inside and outside the vehicle prior to engine disablement and the actuation of a plurality of sirens. To enable the engine after a disablement, a simultaneous actuation of the remote control transmitter and a concealed switch is required.

25 Claims, 3 Drawing Sheets

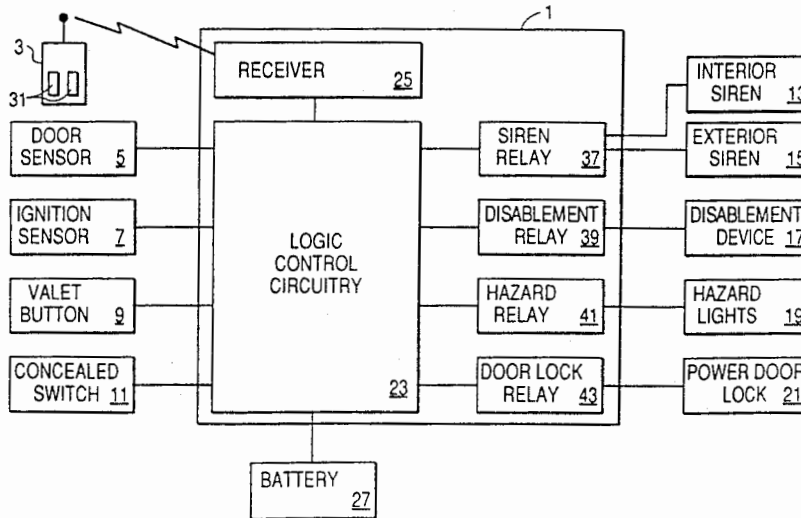
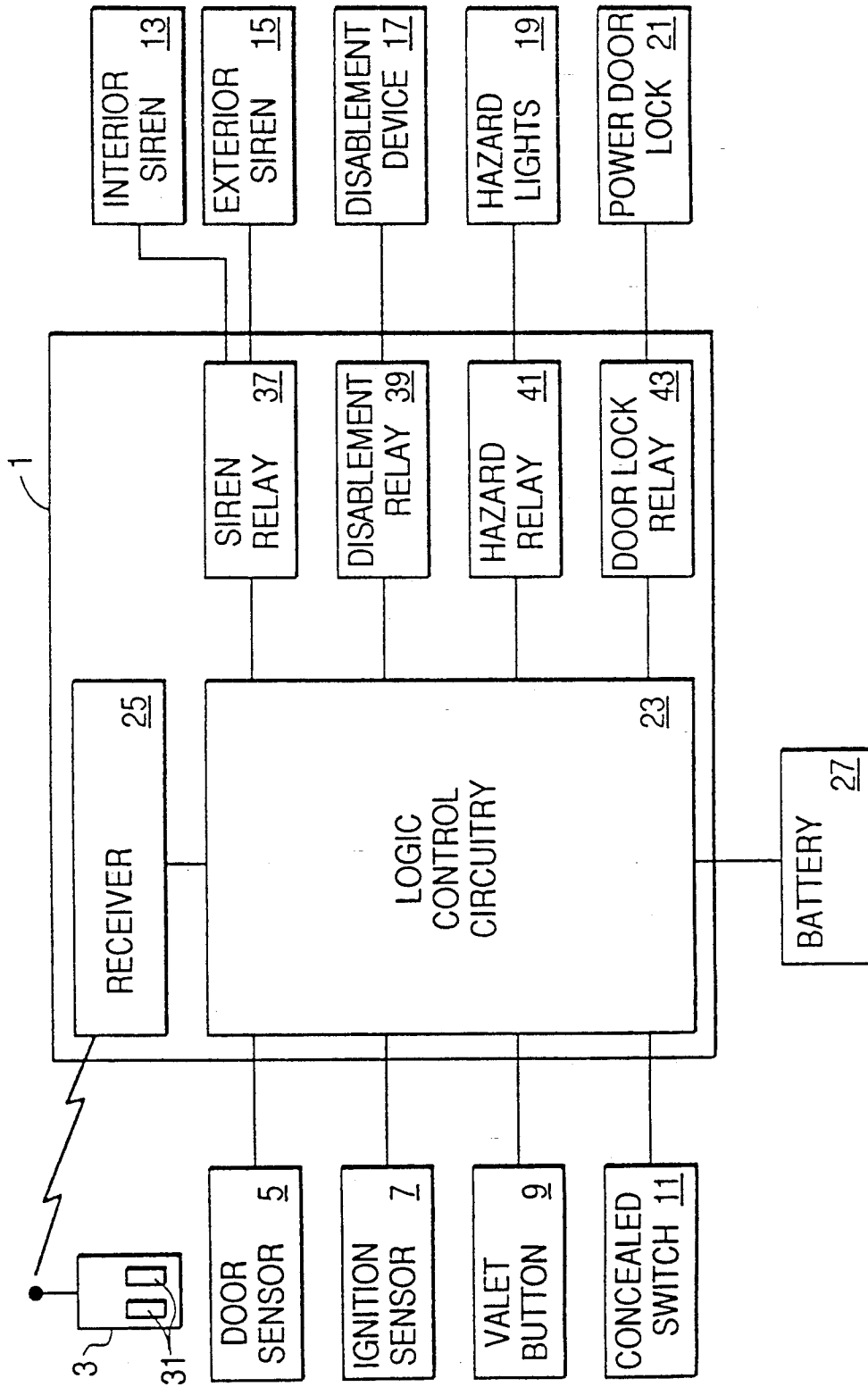


FIG. 1



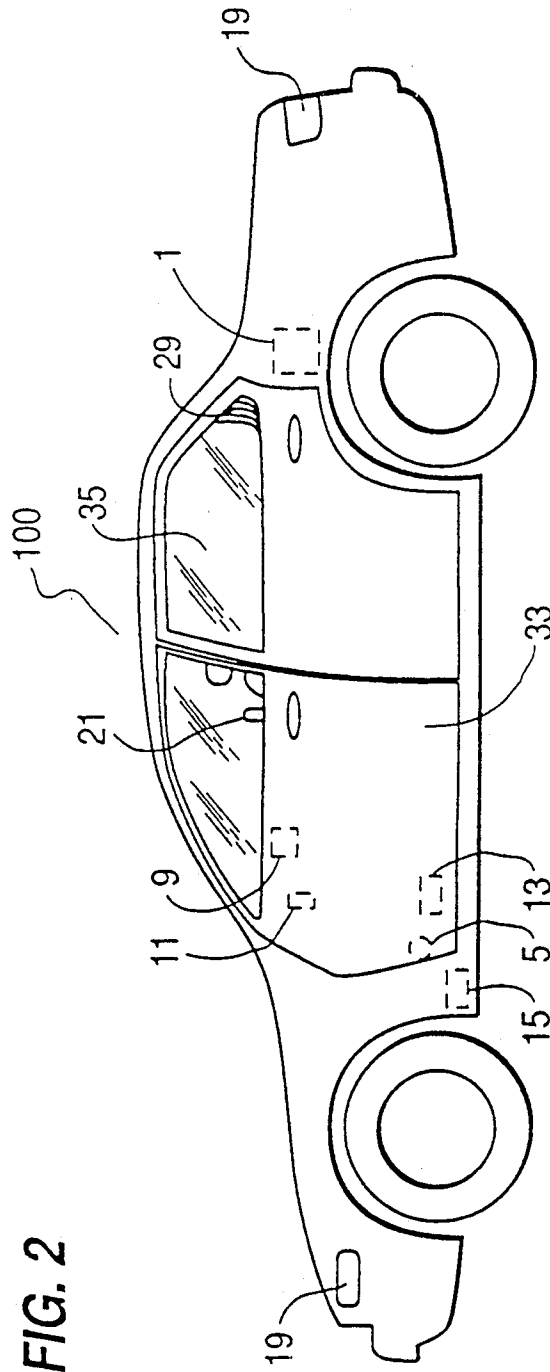
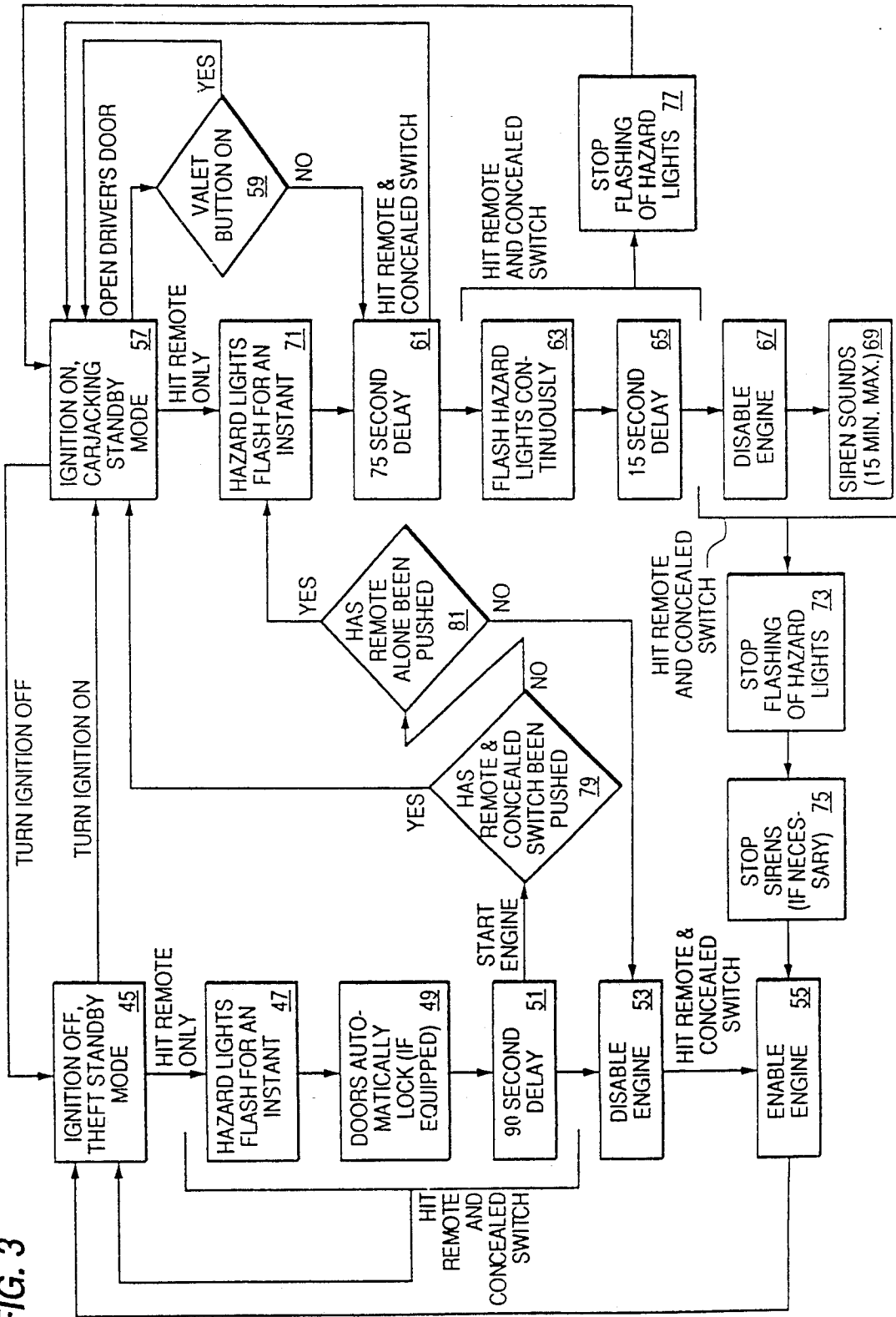


FIG. 2

FIG. 3



VEHICLE SECURITY SYSTEM INCLUDING AN ANTI-CARJACKING SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates in general to vehicle security systems. More specifically, the invention relates to an electronic and mechanical system for protecting a vehicle from theft, regardless whether the vehicle's engine is running.

2. Description of the Related Art

Vehicle thefts are a major problem in today's society. In 1991, the United States alone had 1,661,738 vehicles which were reported stolen. On a smaller scale, that amounts to 1 out every 117 registered vehicles, or a single vehicle every 19 seconds. These thefts have an aggregate estimated cost of over 8.3 billion dollars.

Thefts of parked automobiles have been rapidly increasing over the last few decades. These thefts have traditionally required the thief to "hotwire" the automobile before driving away. The advent of alarm systems have typically protected the vehicle from amateur thieves, but most alarm systems have usually only provided a small obstacle for the professional thief.

Within the last decade, and more specifically within the last few years, many criminals have been resorting to a method of stealing cars commonly referred to as carjacking. Carjacking is defined as the taking of a motor vehicle from the person or presence of another by force, violence, or intimidation. In the majority of carjackings the use of handheld firearms are the weapon of choice to coerce the owner to leave the vehicle.

Carjackings most frequently occur while the owner is driving the vehicle and is temporarily stopped, e.g., at a traffic light. However, carjackings can take other forms. One such form has been to forcefully confront the car owner before the owner enters the car. Once the thief gets the owner's keys, the car is easily taken. This scenario frequently occurs in gas stations and parking lots. Other forms employ a technique of "bumping" an intended vehicle or alerting the driver to a possible vehicle deficiency, causing the driver to pull over thereby facilitating the taking of the vehicle.

Carjacking has become a very popular crime among thieves because of the lack of expertise required to successfully perform a carjacking. Stealing a parked automobile typically requires some form of "hotwiring" experience, while carjacking only requires some sort of coercion, such as with a gun or other weapon, and a propensity to place innocent persons in danger. In 1991, a total of 19,012 carjackings were reported in the United States. Of these carjackings, 6,800 were performed in Los Angeles alone.

Due to the rising value of stolen vehicles, the easy access of handguns, and troubled economic times, the number of carjackings has been rapidly increasing. This increase in carjackings has resulted in a national crisis for which the United States Congress has even considered making it a federal crime. Some states have already passed laws distinguishing it from grand theft auto in attempting to defer carjackings by the imposition of stiffer criminal sentences. While the amount of carjackings are still a small percentage of total vehicle thefts, they produce devastating effects to the victims which may not exist in the theft of unattended vehicles. Armed personal confrontations which occur during carjackings frequently leave the owner feeling helpless and

violated. Further, owners under the threat of a carjacking, who refuse to leave the vehicle or leave the vehicle too slowly, may end up suffering serious bodily injury or even death.

Many attempts have been made to provide vehicle security systems to prevent automobile thefts, however, no present security system can protect a vehicle from all the above theft techniques. Further, many systems which have attempted to prevent some of the theft techniques include drawbacks. A first group of security systems attempt to solve the theft problem by including a device for disabling the engine of a car, preventing its unauthorized use. After disablement, some systems prevent subsequent starting unless the proper passcode or switch has been pressed. Other systems permit engine starting as normal, but will disable the vehicle after a period of time, if a proper switch is not pressed. However, none of these systems provide protection against carjackings.

For example, U.S. Pat. No. 4,064,547 to Zagwyn incorporates a series of operator controlled switches directly connected into the electrical system. Each switch must be correctly set for enabling the vehicle's engine to start.

Other attempted solutions are disclosed in U.S. Pat. No. 4,485,887 to Morano and U.S. Pat. No. 4,302,747 to Belmuth. These patents prevent unauthorized engine running by disabling the engine after the ignition switch is turned off. In Morano, if a push button mounted on the base of the dashboard is not momentarily depressed upon engine starting, a relay will not energize and the current path for the ignition is interrupted by a circuit breaker. According to Belmuth, if a concealed switch is not pressed within forty seconds after engine starting, the engine is subsequently disabled. While these systems help in preventing the theft of unattended vehicles, they do not help protect a vehicle during a carjacking. Further, a experienced thief would probably realized that a concealed button needs to be pressed for engine operation and could possibly find the button, successfully stealing the car in a relatively short amount of time.

Use of a portable transceiver which fits into a vehicle mounted receptacle is disclosed in U.S. Pat. No. 3,646,515 to Vodehnal. Removal of the transceiver from the receptacle disables the vehicle. Any attempt to start the engine while the transceiver is not in the receptacle initiates an alarm. Although Vodehnal may provide satisfactory protection against theft of an unattended vehicle, it provides no protection against carjacking.

A second group of security systems attempt to solve only the carjacking portion of the theft problem. However, many of these device have disadvantages, in addition to not providing theft protection to the vehicle while unattended. For example, U.S. Pat. Nos. 3,735,346 to Fox and 3,781,789 to Caleskie et al. each disclose disabling a vehicle's engine upon opening a car door. Fox delays disablement by 15 minutes to minimize danger to the driver, but once disabled the vehicle can be restarted by closure of a single switch. A disadvantage of this resetting method is that a carjacker can restart the engine and drive away upon finding the switch. According to Caleskie et al. a vehicle engine cannot be restarted until a non-reversible timer has completed its cycle. However, using a non-reversible timer may result in instances where the rightful owner cannot reset the system and start the engine because the

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