(54) Titre : INTEGRATION D'UN DISPOSITIF DE COMMANDE DE SYSTEME DE DETECTION PAR ULTRASONS ET DE COMPOSANTS HMI DANS UN RETROVISEUR
(54) Title: INTEGRATION OF AN ULTRASONIC DETECTION SYSTEM CONTROLLER AND HMI INTO A REAR VIEW MIRROR

(57) Abrégé/Abstract:
A detection system arrangement includes a vehicle component with an interface on the vehicle component. A master controller is mounted inside of the vehicle component and is operably connected to the interface for providing activation signals to the interface. One or more ultrasonic sensors are connected to the exterior of the vehicle and provide signals to the master controller based on conditions sensed by the one or more sensors.
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CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a PCT International Application claiming the benefit of U.S. Provisional Application No. 61/125,702, filed April 28, 2008.

FIELD OF THE INVENTION

The present invention relates to a detection system arrangement for a vehicle.

BACKGROUND OF THE INVENTION

Detection system arrangements have been utilized in vehicles for several different purposes such as alerting drivers to factors external to the vehicle. For example, some arrangements alert the driver to the presence or absence of an object in relation to the vehicle, as well as light conditions, vehicle temperature, etc. In the past, typical detection system arrangements utilized three types of components: a sensor or sensors for providing a signal indicative of a measured value or parameter, a master interface for receiving signals from the sensor and generating signals to an interface component. The interface component can be visual, audio, or other suitable sensory alarms or indicators that notify the driver of a sensed condition or parameter.

One specific example of a detection system arrangement is a proximity sensor which senses the presence or absence of an object in relation to a vehicle. For example, a back-up sensor can detect the presence of another vehicle, wall, or person and then send a signal to the master controller which in turn sends a signal to the interface notifying the driver that there was an object behind the vehicle. Depending on where the sensor is placed on the vehicle, the distance between the sensor and the master controller can be quite far and require a sophisticated wiring harness for carrying the signal
from the sensor to the master controller. Additionally, depending on the position of the master controller in relation to the human interface, more wiring could be needed to connect the interface to the master controller. Thus, there is a need to develop a more standardized arrangement of the components of the detection system that would both minimize the amount of connections and wiring that needs to be made between components as well as present some sort of industry or model standard for the placement of the components.

10 SUMMARY OF THE INVENTION

In accordance with the present invention a detection system arrangement having a vehicle component with an interface on the vehicle component is provided. A master controller is mounted inside of the vehicle component and is operably connected to the interface and provides activation signals to the interface. One or more ultrasonic sensors connected to the exterior of the vehicle provide signals to the master controller based on conditions sensed by the one or more sensors.

Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples, while indicating the preferred embodiment of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention.

25 BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

Fig. 1 is a schematic view of a prior art detection system arrangement;

Fig. 2 is a schematic view of one embodiment of the present invention;
Fig. 3 is an alternate embodiment of the present invention incorporated in a rear view mirror housing.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The following description of the preferred embodiment(s) is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses.

Fig. 1 depicts a prior art schematic view of a detection system arrangement 10 having multiple sensors 12. The sensors 12 can be proximity detection sensors or the like. The sensors 12 communicate through wiring harnesses 13 to a master controller 14. The master controller 14 is mounted at a position 16 somewhere in the vehicle between the sensors 12 and an interface 22. For example, the location 16 for mounting the master controller 14 is sometimes located in the trunk of the vehicle for systems having sensors 12 that are configured on the rear bumper of the vehicle.

The interface 22 is an interface that interacts with the driver through some type of sense, such as an audio alarm or visual flashing lights. The interface 22 is typically mounted in some sort of area 20 which is in the interior of the vehicle. The interface 22 receives signals from the master controller 14 through a second wiring harness 18 causing activation of the interface 22.

This prior art design requires extra wiring between the interface and master controller. Additionally, most prior art detection system arrangements provide no standard for the positioning of the master controller and interface. Instead, the master controller can be located virtually anywhere in the vehicle and the interface is located separate from the master controller and is also located at virtually any position in the interior of the vehicle. The additional components as well as the placement of the components increases the possibility of having quality issues during the assembly of the vehicle as well.
as quality issues with the individual components such as the wiring harness 18 which is located between the master controller 14 and the interface 22.

Fig. 2 is a schematic view of one embodiment of the present invention having a detection system arrangement 100. This particular arrangement has one or more sensors 102 positioned at a location 104. Sensors 102 are ultrasonic detection sensors or any other suitable sensors for measuring a given parameter. The sensors 102 are mounted to various locations 104 which include a front bumper fascia, rear bumper fascia, doors, mirrors, roof, vehicle underbodies, pillars, as well as tire rims and hitches. The sensors 102 are connected to a master controller 106 through wiring harnesses 108. In an alternate arrangement a single wiring harness 109 is shown in dashed lines. This further reduces the number of connections needed between the sensors 102 and master controller 106. Additionally, while the present embodiment of the invention depicts three sensors, it is possible to have a greater or lesser number of sensors depending on the needs of a particular application.

The master controller communicates to an interface 110 through a connection 112. The connection 112 can be a wiring harness or it can be a plug where both the interface 110 and the master controller 106 are integrated with one another. It is also within the scope of this invention for the master controller 106 and interface 110 to be a single integrated unit.

In the present embodiment, both the master controller 106 and the interface 110 are located in a vehicle component 114. Thus, the detection system arrangement 100 provides a standard location for the interface 110 and master controller 106, which cuts down on assembly errors as well as the number and distance of the connections that have to be made between components. The interface 110 provides an alarm which can include combinations of an audio or visual or mechanical alarm. The interface 110 and master controller 106 are provided in a standard rear view mirror housing.
The vehicle component 114 is any type of vehicle component having a housing that is common to all vehicles. The vehicle component 114 in one embodiment is a single vehicle component; however, it is within the scope of this invention for the vehicle component to include an assembly of multiple components capable of housing the detection system arrangement. In a preferred embodiment, the interface 110 and master controller 106 are provided in an industry standard rearview mirror housing. The vehicle component 114 in alternate embodiments is selected from a center high mounted stop lamp housing, a center high mounted stop light, a speaker housing, a head liner, a head liner display, an arm rest, an instrument panel, a dashboard, a headrest, a side view mirror, an exterior side view mirror, a steering wheel, or another component which is common in all vehicles. Thus, the vehicle component 114 can be any type of vehicle component common to all vehicles.

A vehicle input/output connection 116 is also connected to the master controller 106 to provide communications with other vehicle interfaces that are external to the vehicle component 114. The vehicle input/output connection 116 can be coupled to an emergency activation system 117. The emergency activation system 117 can include a controller that is capable of causing the vehicle to automatically take corrective action. For example the emergency activation system 117 can be an automatic braking system that brings the vehicle to a stop or some sort of steering mechanism capable of steering the vehicle or even an acceleration control mechanism capable of speeding the vehicle up. The emergency activation system can also be a communications device capable of contacting emergency services in the event of a collision. Additionally, the vehicle input/output connection 116 can provide power to the master controller 106 which can then distribute power to the interface 110 and thus eliminate the need for separate power communication lines to the interface 110.
Fig. 3 depicts the aforementioned embodiment wherein a detection system arrangement 200 is incorporated specifically into a rear view mirror housing 202. Inside of the rear view mirror housing 202 is the master controller 204 which receives signals from sensors in the same manner as shown in Fig. 2. The master controller 204 is connected to the interface 206, 208 which in this case is a series of visual lights that indicate the presence direction and distance of an object. The detection arrangement 200 in this particular embodiment of the invention is used as a back-up sensor for indicating to the driver whether or not an object is present in proximity to the rear of the vehicle. The interface 206, 208 includes a series of lights with groups on the left side and right side of the mirror housing 202. The lights are activated and more lights can be activated to indicate the distance that the vehicle is from an object. Additionally, the interface 206 communicates to the driver where the object is, that is whether the object is on the left side of the vehicle or the right side of the vehicle by illuminating the group of lights on the left side or the right side of the mirror housing 202.

The description of the invention is merely exemplary in nature and, thus, variations that do not depart from the essence of the invention are intended to be within the scope of the invention. Such variations are not to be regarded as a departure from the spirit and scope of the invention.
CLAIMS

1. A detection system arrangement comprising:
   a vehicle component;
   an interface in said vehicle component;
   a master controller mounted inside of said vehicle component and
   operably connected to said interface and providing signals to activate said
   interface; and
   one or more sensors connected to the exterior of a vehicle and
   providing signals to said master controller based on conditions sensed by the
   one or more sensors.

2. The detection system arrangement of claim 1, wherein the
   vehicle component is one selected from the group comprising:
   a center high mounted stop light, a center high mounted stop lamp
   housing, a speaker housing, a head liner, a head liner display, an arm rest, an
   instrument panel, a dashboard, a headrest, a side view mirror, an exterior side
   view mirror, a rear view mirror, or a steering wheel.

3. The detection system arrangement of claim 1, wherein the
   interface and the master controller are integrated as a single component.

4. The detection system arrangement of claim 1, wherein the
   interface provides an alarm which is activated in response to a signal received
   from the master controller.

5. The detection system arrangement of claim 1 wherein said one
   or more sensors is connected to said master controller through a single wiring
   harness.
6. The detection system arrangement of claim 1 wherein said interface receives a signal from said master controller to generate an alarm.

7. The detection system arrangement of claim 1 wherein said one or more sensors are connected to a location on the vehicle, wherein the location comprises one or more of the following:
   front bumper fascia, rear bumper fascia, doors, mirrors, roof, vehicle underbodies, tire rims, hitches and pillars.

8. A detection system arrangement comprising:
   an interior rear view mirror housing;
   an interface in said housing;
   a master controller mounted inside of said housing and operably connected to said interface to activate said interface; and
   one or more sensors connected to the exterior of the vehicle and providing signals to said master controller based on conditions sensed by the one or more sensors.

9. The detection system arrangement of claim 8, wherein the interface and the master controller are integrated as a single component.

10. The detection system arrangement of claim 8, wherein the interface provides an alarm which is activated in response to a signal received from the master controller.

11. The detection system arrangement of claim 8 wherein said one or more sensors is connected to said master controller through a single wiring harness.
12. The detection system arrangement of claim 8 wherein said interface receives a signal from said master controller to generate an alarm.

13. The detection system arrangement of claim 8 wherein said one or more sensors are connected to a location on the vehicle, wherein the location comprises one or more of the following:
   front bumper fascia, rear bumper fascia, doors, mirrors, roof, vehicle underbodies, tire rims, hitches and pillars.

14. The detection system arrangement of claim 8 wherein said interface is a series of visual lights that indicate the presence of an object.

15. The detection system arrangement of claim 14 wherein said series of lights include a group of left side lights and right side lights, wherein said lights are illuminated to indicate the direction of an object as well as the distance to said object.