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(54) HORN NOTIFICATION DEVICE AND METHOD FOR OTHER VEHICLE

Summary

This invention relates to a horn notification device of another vehicle, and it is sometimes difficult to know the horn sound of another vehicle due to the use of audio inside the vehicle, so to solve this problem, it provides horn notification methods for other vehicles consisting of the sound around the vehicle being received and measured by separating the frequency of the horn (ST10), the step of determining whether the horn sound is output from the own vehicle (ST20), the step of measuring the volume inside the vehicle (ST30), and the step of outputting a warning signal to the driver when the horn of another vehicle is measured (ST40), and it also provides horn notification methods for other vehicles consisting of the indoor microphone (10) that measures the volume inside the vehicle, an outdoor microphone (20) installed on both sides of the rear of the vehicle to receive sound generated around the vehicle, the frequency analyzer (30) that measures the frequency of the sound received by the outdoor microphone (20) and outputs a measurement result, the horn sensor (40), which checks the horn motion of its own vehicle and outputs an operation signal, the ECU (50) that detects the horn of another vehicle according to the output result of the frequency analyzer (30) and the operation signal of the horn sensor (40) and outputs a control signal accordingly, and the displayer (60) of a warning signal to a driver by a control signal output from the ECU (50).

Representative Figure

Figure 1

Specification

Brief description of the Figure

Figure 1 is a flowchart illustrating a horn notification method of another vehicle according to the present invention.

Figure 2 is a block diagram showing the configuration of an embodiment of a horn notification device of another vehicle of the present invention.

Figure 3 is a diagram illustrating an outdoor microphone installation state of a horn notification device of another vehicle according to the present invention.

- Description of the sign for the main part of the Figure -

10: Indoor microphone 20: Outdoor microphone

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30: Frequency analyzer 40: Horn detector

50: ECU 60: Displayer

Detailed description of the invention

The purpose of an invention

The technology to which the invention belongs and the prior art in the field

This invention relates to a horn notification device of a counterpart vehicle, and in particular, to a horn notification device of another vehicle that visually informs the driver of the occurrence of the horn sound of the other vehicle by detecting the occurrence of the horn sound when the other vehicle generates a loud noise inside or outside the vehicle.

If you try to move from one lane to another lane when the vehicle is driving, the risk of an accident increases if you do not recognize that the vehicle driving in the lane to be moved to is close. At this time, the vehicle in the next lane sounds a horn to notify of the danger, and the driver who recognizes this stops moving into the lane to prevent an accident.

In addition to these cases, vehicle horns are used to inform pedestrians or other vehicles of danger.

However, when the driver operates the vehicle while maximizing the audio volume of the vehicle, there are cases where the horn of another vehicle cannot be heard due to the audio sound, and in this case, a major accident occurs.

In addition, even if the vehicle audio volume was not maximized, the noise around the vehicle prevented the driver from hearing the horn of another vehicle, causing an accident.

The technical challenge that the invention seeks to achieve

This invention was created to solve the above problems, and it is intended to provide a horn notification device for another vehicle that can prevent a traffic accident in advance by detecting when another vehicle sounds a horn in a noisy place and warning the driver.

The composition and action of the invention

Figure 1 is a flowchart illustrating a method of operating a horn notification device of another vehicle according to the present invention, which includes a step (ST10) of separating and measuring the frequency of the horn after receiving the sound around the vehicle, a step (ST20) of determining whether the horn sound is output from the own vehicle, a step (ST30) of measuring the volume inside the vehicle, and a step (ST40) of outputting a warning signal to a driver when the horn sound of another vehicle is measured.

Figure 2 is a configuration diagram showing the configuration of an embodiment of a horn notification device of another vehicle according to the present invention, which includes an indoor microphone (10) for measuring the volume inside the vehicle, an outdoor microphone (20) installed on both sides of the rear side of the vehicle to receive sound generated around the vehicle, a frequency analyzer (30) for measuring the sound frequency received by the outdoor microphone (20) and outputting the measurement result, a horn sensor (40) for checking the horn operation of the vehicle and outputting the operation signal thereof, an ECU (50) for detecting a horn of another vehicle and outputting a control signal accordingly, and a displayer (60) for outputting a warning signal to a driver by a control signal output from the ECU (50).

An embodiment of the present invention configured as described above will be described as follows with reference to the Figures.

An indoor microphone (10) that measures the volume inside the vehicle and an outdoor microphone (20) that measures the sound generated around the vehicle are installed inside and outside the vehicle, respectively, to receive sound inside and outside the vehicle. It is preferable that the indoor microphone (10) is installed at a position close to the driver's position. In addition, the outdoor microphones (20) are installed on both sides of the rear of the vehicle to receive the horn of another vehicle.

At this time, even if another driving vehicle in front of the vehicle does not hear the horn, it is possible to grasp the dangerous moment by sight, but in the case of another driving vehicle behind the vehicle, it is difficult to hear the horn, so it is preferable that the outdoor microphone (20) is installed on both sides of the rear of the vehicle as shown in FIG. 3.

The sound around the vehicle is received using the outdoor microphone (20) (ST10), the frequency of the external sound received by the outdoor microphone (20) is measured using the frequency analyzer (30), and the ECU (50) determines whether the frequency measured by the frequency analyzer (30) includes the frequency corresponding to the horn (ST20).

The horn of the vehicle may differ depending on the manufacturer of the vehicle, but it is common to have a high frequency to facilitate recognition even at a long distance. Also, since the frequency is high, it is a sound that does not exist in nature, so it is not confused with other sounds.

Even when the frequency of the horn sound is detected by the ECU (50), if it is found that the horn sound generated from the vehicle is received using the signal output from the horn sensor (40), the operation of the next step is not performed.

However, if it is determined that the frequency of the horn sound detected by the ECU (50) is not the horn sound generated by the vehicle, the next step is performed.

By performing step (ST30) of measuring the volume of the vehicle interior using the indoor microphone (10), if it is determined that the volume received by the indoor microphone (10) is more than a certain level, that is, the driver is unable to listen to and recognize other sounds due to music output from the audio speaker, the ECU (50) outputs a control signal.

However, if the volume received by the indoor microphone (10) is small, the driver may listen to the horn sound of the external vehicle without using a separate device, so it is okay not to output a separate warning signal.

As a result of measuring the frequency of the sound received by the outdoor microphone (20), when it is determined that a frequency corresponding to the vehicle horn is included, that the horn is the horn of another vehicle, and that the volume of the sound received by the indoor microphone (10) is greater than or equal to a certain level, the ECU (50) outputs a control signal so that the displayer (60) operates.

Upon receiving the control signal, the displayer (60) presents a warning message such as "Horn" to notify the driver that another vehicle has sounded a horn.

Although the present invention has been illustrated and described above with respect to certain preferred embodiments, the present invention is not limited to these embodiments and includes all various types of embodiments that may be implemented without departing from the technical idea of the present invention claimed by a person having ordinary knowledge in the art.

The effect of an invention

As described above, according to the present invention, when it is difficult to know the horn of another vehicle due to the use of vehicle audio, etc., it has the effect of enhancing the safety of the vehicle by visually warning the driver when the horn of another vehicle occurs.

(57) Scope of Claims

Claim 1.

A horn notification method of another vehicle comprises a step of separating and measuring the frequency of the horn sound after receiving the sound around the vehicle (ST10), a step of determining whether the horn sound is output from the own vehicle (ST20), a step of measuring the volume inside the vehicle (ST30), and a step of outputting a warning signal to the driver when the horn sound of another vehicle is measured (ST40).

Claim 2.

An indoor microphone (10) for measuring the volume inside the vehicle, an outdoor microphone (20) installed on both sides of the rear of the vehicle to receive sound generated around the vehicle, a frequency analyzer (30) for measuring the sound frequency received by the outdoor microphone (20) and outputting the measurement result, a horn sensor (40) that checks the horn operation of its own vehicle and outputs an operation signal thereof, an ECU (50) that detects the horn of another vehicle by the output result of the frequency analyzer (30) and outputs a control signal accordingly, and a displayer (60) that outputs a warning signal to the driver by a control signal output from the ECU (50).

Figure

Figure 1

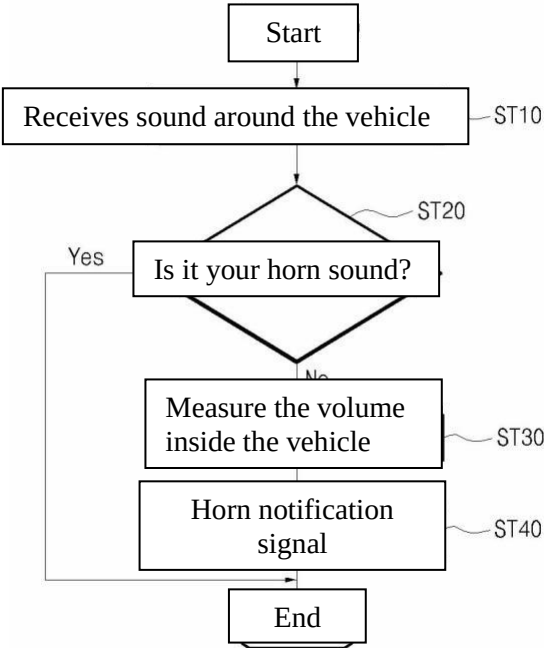


Figure 2

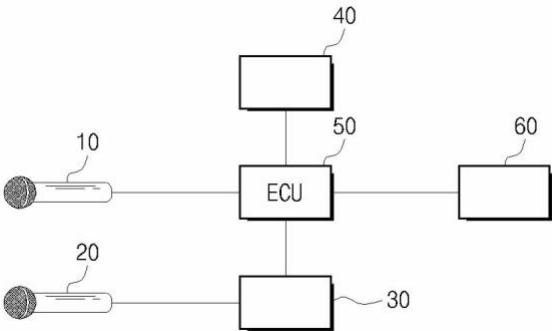
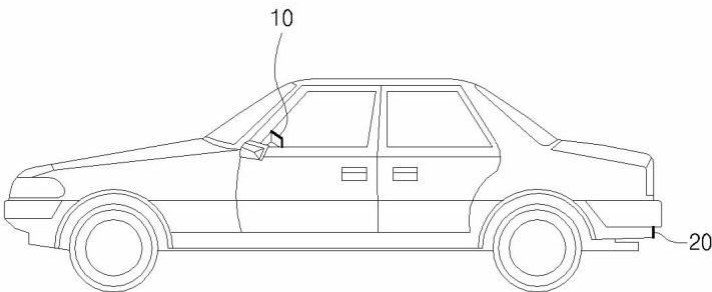


Figure 3





TRANSLATION CERTIFICATION

Date: September 2, 2024

To whom it may concern:

I, Jean Sim, a translator fluent in the Korean and English languages, on behalf of Morningside, do solemnly and sincerely declare that the following is, to the best of my knowledge and belief, a true and correct translation of the document(s) listed below in a form that best reflects the intention and meaning of the original text.

All statements made in this declaration of my own knowledge are true and all statements made on information and belief are believed to be true. I make these statements with the understanding that willful false statements are punishable by fine or imprisonment, or both (18 U.S.C. 1001).

The document is designated as:

- KR20040091262A

A handwritten signature in cursive script that reads "Jean Sim". The signature is written in dark ink on a light-colored background.

Signature

Jean Sim

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