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54 Title of the Patent Invention
A Vehicle Speed Limit Warning Device

57 Abstract

PURPOSE: The object is to make the driver aware of the speed limit of the road, no matter what road is being driven.

CONSTITUTION: A navigation system 11 detects the coordinates of the present location of the vehicle, the receiver 6 receives the speed limit information for each road section which is transmitted from a beacon, the memory 7 stores this speed limit information, the microcomputer 12 detects the speed limit of the road where the driver is driving at present by means of the coordinates information of the current vehicle location from the navigation system 11 and from the speed limit information for each every road section from the memory 7 and the detected speed limit is displayed by the display equipment 13.

CLAIMS

Claim 1

A vehicle speed limit warning device comprised of an information reception means receiving the speed limit information of each specific road section which is transmitted from beacons disposed on the roads, and an information recording means recording the speed limit information acquired by means of this information reception means, and a vehicle location computation means computing the location coordinates of the current location of the vehicle, and a determination means acquiring the current location coordinates of the vehicle location from said vehicle location computation means and finding the road section of the current vehicle location coordinates and determining the speed limit information from the information recorded in said information recording means and determining the speed limit information of that road section, and a notification means notifying the driver of the speed limit information determined by means of that determination means.

Detailed Description of the Invention

[0001]

Field of Industrial Use

The present invention relates to a vehicle speed limit warning device.

[0002]

Conventional Technology

A block diagram of the circuits of a typical conventional vehicle speed limit warning device is represented in FIG. 6, and this is explained hereafter in accordance with FIG. 6.

[0003]

The velocity conversion device 16 acquires the detected signals of the wheel velocity sensor 15 and converts it to the running velocity. The running velocity converted by this velocity conversion device 16 is displayed on speedometer 17. The warning sound generation device 18 acquires the running velocity converted by this velocity conversion device 16 and determines whether it is in excess of a specific value (e.g. 105 Km/h) in order to generate a warning, and a warning is generated over the speaker when it is in excess of the specific value.

[0004]

Problems to be Solved by the Invention

In respect of this conventional vehicle speed limit warning device, there are times when the specific value is not identical with the speed limit of the road being driven because the specific value in order to generate the warning is fixed [in the apparatus].

[0005]

The present invention was conceived of in order to resolve the cited issues, and has as its objective making the driver aware of the speed limit of the road, irrespective of what roads are driven.

[0006]

Summary of the Invention

In order to achieve said objectives, the invention of claim 1 as represented in FIG. 1 corresponding to the claim, said vehicle speed limit warning device is configured from an information reception means 1 receiving the speed limit information of each specific road section which is transmitted from beacons disposed on the roads, and an information recording means 2 recording the speed limit information acquired by means of this information reception means 1, and a vehicle location computation means 3 computing the location coordinates of the current location of the vehicle, and a determination means 4 acquiring the current location coordinates of the vehicle location from that vehicle location computation means 3 and finding the road section corresponding to the current vehicle location coordinates and determining the speed limit information from the information recorded in said information recording means 2 and determining the speed limit information of that road section, and a notification means 5 notifying the driver of the speed limit information determined by means of that determination means 4.

[0007]

Effects

Said vehicle location computation means 3 computes the current location coordinates of the vehicle. The speed limit information for each specific road section transmitted from the beacons is acquired by means of said information reception means 1 and is recorded by means of said information recording means 2. Said determination means 4 acquires the location coordinates of the current location of the vehicle from the vehicle location computation means 3 and finds the road section where the current location coordinates exist from the information recorded in said information recording means 2 and determines the speed limit information thereof. The determined speed limit information is displayed on said display means 5 and notified to the driver.

[0008]

Figure 2 is a block diagram of the first embodiment of the present invention. Hereafter an explanation is provided based on the block diagram of FIG. 2. Firstly, the configuration is explained.

[0009]

It is comprised of the geomagnetic sensor 8, in order to detect the bearing of the vehicle being driven, and wheel velocity sensor 9, in order to detect the running velocity of the vehicle, and the CDROM 10 recording the road map, and the navigation system 11 (In the configuration described above, this is configured by the vehicle location computation means according to claim 1), and the

receiver 6 as the information receptor means claimed in claim 1 receiving data from beacons transmitting the speed limit information of each of the road sections, and the memory 7 as the information recording means claimed in claim 1 recording the received speed limit information, and the microcomputer 12 as the determination means claimed in claim 1 performing the overall process control, and the display device 13 as the display means claimed in claim 1 displaying the speed limit.

[0010]

Next, the operations are explained. The earlier described navigation system 11 computes the current location, as the departure point, from the values output from said geomagnetic sensor 8 detecting the bearing of the driven direction of the vehicle and the values output from said wheel velocity sensor 9 detecting the running velocity of the vehicle, and compares that with the road sections in the road map prerecorded in said CDROM 10, to determine the road section where the vehicle is currently being driven. Said receiver 6 receives the speed limit information transmitted from the beacons and records and stores the received information in said memory 7.

[0011]

Said microcomputer 12 operates in accordance with the flow chart represented in FIG. 3. Hereafter, an explanation is provided according to FIG. 3.

[0012]

In step F300, the information of the road sector currently being driven is acquired from said navigation system 11.

[0013]

In step F305, that information is sent to said memory 7, and the speed limit information of the road currently being driven on is output.

[0014]

In step F310, the speed limit information which said memory 7 outputs is acquired. In step F315, the received speed limit information is sent to said display apparatus 13. This completes the explanations of the operations of said microcomputer 12.

[0015]

Said display apparatus 13 displays the speed limit information acquired from said microcomputer 12.

[0016]

One example of the form of the display is represented in the elevated view of the speedometer in FIG. 4. This shows how the speed limit information is alphanumerically displayed as part of the speedometer, and the driver is informed of the speed limit of the road currently being driven by the display green LEDs of the velocities below the speed limit on the outer side of the speedometer, and the velocities above the speed limit in red.

[0017]

Another example of a speedometer of the present invention is represented in the elevated view in FIG. 5. Vehicle restriction information, other than the speed limit information, such as one-way street or entry prohibited information is acquired from the beacons, and information on the prohibition of right or left turns at the next intersection are informed to the driver by modification of the color of the winker indicator 14 in the upper part of the speedometer.

[0018]

Now, when the driven speed of the vehicle exceeds the speed limit, instead of displaying the speed limit on the speedometer, the driver can be informed thereof by the sounding of a warning buzzer, and instead of displaying the left or right turn prohibition information on the speedometer, when the winker [indicator] is operated just before an inoperable left turn, the driver can be informed of the prohibition of the left turn by a warning buzzer.

[0019]

Moreover, in this embodiment, the vehicle location computation means of claim 1 was configured from the geomagnetic sensor 8, the wheel velocity sensor 9 and the CDRM 10, but it is not limited to this in the present invention, and said vehicle location computation means may be configured by employing GPS as represented in Japanese laid-open unexamined patent specification S62-98214 or in Japanese laid-open unexamined patent specification S62-140080.

[0020]

Effects of the Invention

As described above, by means of the present invention, no matter what type of road is being driven, there is the derivation of the benefit that the driver can be made aware all the time of the speed limit.

Brief Description of the Drawings

Figure 1: The figure corresponding to the invention of claim 1
A block diagram of the multidisc player where the present invention is applied.

Figure 2: A block diagram of the first embodiment of the present invention.

Figure 3: A flow chart of the functions of the microcomputer.

Figure 4: One example of the of the speedometer display by means of the present invention.

Figure 5: One example of the of the speedometer display by means of the present invention.

Figure 6: A block diagram of a prior art example.

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