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INTELLIGENT ELECTRIC SOUND SYSTEM - METHOD AND CONTROL DEVICE FOR INFLUENCING AN ARTIFICIAL SOUND ACTUATOR EXTERIOR NOISE OF AN ELECTRIC VEHICLE

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INTELLIGENT ELECTRIC SOUND SYSTEM - METHOD AND CONTROL DEVICE FOR INFLUENCING AN ARTIFICIAL SOUND ACTUATOR EXTERIOR NOISE OF AN ELECTRIC VEHICLE

Technical task:

The technology implements a procedure and the control device for influencing the personalized acoustics of an acoustic generator in an e-vehicle by taking into account predictive traffic data, GPS, VZE or completely private, i.e. personally defined areas.

Initial situation:

Especially in traffic-calmed street areas, such as inner-city zones or play streets, a relatively high sound pressure level is present, which results from the sound of motor vehicles and has a negative influence on the people and animals in this environment. In addition to the permanent stress of the sound system, this condition also leads to secondary inattention of the people around the motor vehicle and dangerous situations arise due to misjudgement. For example, a leisurely stroll along a beach promenade or sitting in a special place in the city centre at the weekend can be disturbed by a motor vehicle with loud engine noise. Often this loud engine noise is even desired by the driver to attract attention. The personalised acoustic behaviour around one's own home is also of particular importance in this respect. Increasingly, sound systems of motor vehicles with a particularly effective, sporty sound character are also enjoying great popularity. Electrical sound actuators produce an artificial, pithy engine noise that can be switched on depending on various CAN/bus signals of the vehicle or manually. However, sound generators are also used in electrically powered vehicles and are often coupled with the driving dynamics programs of a drive, which for example takes into account a sports or race setting. In this context there are the patent applications DE102009030820 A1, DE102011088901 A1 and DE102012005073 A1, which primarily focus on noise reduction of combustion engines or in the vehicle interior and do not take into account environmental data or personal preferences.

Solution:

The Intelligent Electric Sound System describes a method and a control device for influencing the personalized acoustics of a sound generator of an electric vehicle. It takes into account predictive traffic data, e.g. GPS, VZE, etc., as well as very individual, personal and personalised preferences of the driver, such as the home environment of the apartment. The differentiation of the invention from the state of the art leads to a control device and a procedure for an even more individual and intelligent e-vehicle which uses the following components and modules:

- a GPS system/navigation system
- a VZE traffic sign recognition system
- a front camera
- an ISS control unit/controller
- a personalised data memory
- an electric sound generator for an electrically powered motor vehicle

In various designs, the influence on a sound generator control in and on a motor vehicle with electric drive is exerted by an individual driver-specific database, which takes into account preferences and inclinations, for very personal, privately defined areas, such as the individual home.

The personification of the development uses different control interventions (SE 1-n) with different desired acoustics according to preferences (1-n) and inclinations (1-n), whereby (1-n) stands for the acoustic variance and thus indirectly for any number of drivers (1-n) of a motor vehicle and these (1-n) areas can be assigned to areas of an environment around the motor vehicle.

Functional sequence:

If a motor vehicle is moved along a route, for example into an area marked as traffic-calmed, and predictive navigation data or GPS signals are available and/or a VZE traffic sign system recognises these properties of the traffic area, then an influence is exerted on the sound generator control systems of the motor vehicle. The latter influence works in two steps, i.e. in a first step, a sound program permanently assigned to the active driving program, for example a sports or race program, i.e. a sound setting is automatically switched off. In a second processing step, the sound program is transformed into an electrical acoustic behavior personalized in a special design, depending on the assigned traffic space. In this way, especially in urban traffic, for example near public places with street cafes, promenades, ice cream parlors, etc., the current spirit of the age, especially young and/or sports-visionary automobile fans, can be counteracted and the quality of life of other road users and passers-by can be increased. A personalised preference of an electric sound character by the driver can be taken into account, especially for users of motor vehicles who are aware of the noise pollution in sensitive areas. On the other hand, this means that in areas with unrestricted characteristics, such as a private area or a sports facility, there are generally no restrictions and in this area, under certain circumstances, even a special personalised electric sound is made possible.

Advantages:

- Increasing innovation and personalisation of e-vehicles
- Increasing individuality in the electric motor vehicle and added value in general