

METHOD AND SYSTEM FOR OPTIMIZING AND DESIGNING LOW IN-VEHICLE NOISE

ABSTRACT

A method and a system for optimizing and designing low in-vehicle noise are provided. Sound transmission losses TL_i of different regions of a to-be-designed vehicle and sound powers L_{wj} of sound source devices are inputted to an in-vehicle noise simulation-prediction-analysis model; noise prediction are performed based on the in-vehicle noise simulation-prediction-analysis model iteratively with starting with initial sound transmission losses and initial sound powers under a constraint on a total cost for in-vehicle noise reduction, until a predicted noise value L_{psi} satisfying a minimum total cost for in-vehicle noise reduction is outputted; a design parameter of each of the different regions of the to-be-designed vehicle and a design parameter of each of the sound source devices used to obtain the predicted noise value L_{psi} are acquired to design a vehicle. By performing noise prediction iteratively based on the in-vehicle noise simulation-prediction-analysis model, a predicted noise value L_{psi} that has no deviation and satisfies a minimum total cost for in-vehicle noise reduction is obtained, so that the method for optimizing and designing low in-vehicle noise has a short period, low cost and is not prone to deviation. In addition, the method does not require any subjective experience from a designer for vehicle design, and thereby has no subjectivity.

Fig. 1