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ICC - INTELLIGENT CLEAN CAR - PROCEDURE AND TAX DEVICE AT AN EXTERNAL MIRROR FOR IMPACTING ON A CLEAN STREET OR PAINTED SIDE WALL FRAMES OF A MOTOR VEHICLE I

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ICC - INTELLIGENT CLEAN CAR - PROCEDURE AND TAX DEVICE AT AN EXTERNAL MIRROR FOR IMPACTING ON A CLEAN STREET OR PAINTED SIDE WALL FRAMES OF A MOTOR VEHICLE IN RESPECT OF ENVIRONMENTAL CONDITIONS

Technical task:
The aim of the invention is to prevent soiling of the sidewall frame of a motor vehicle.

Initial situation:
The visual appearance of motor vehicles shows locally conspicuous contamination on the outer skin, i.e. the paint surface, in very specific areas, while the vehicle is relatively clean laterally in the belt zone upwards. Very often, motor vehicles which are moved on dirty roads in the rain, for example in a spray, show dirt deposits at very typical points on the body in the area of the wheel arch on the rear side panel in the area of the door handle. The dirt deposits result from the flow of the airstream in connection with construction-related negative or positive pressure conditions in the door gap area (dead water area behind the door handle) to the body. This dirt is clearly visible, especially with light-coloured vehicle exterior paintwork. Even short journeys in rain or spray cause this conspicuousness and lead to complaints from the driver if a visually clean motor vehicle always shows this dirt conspicuousness in one place.

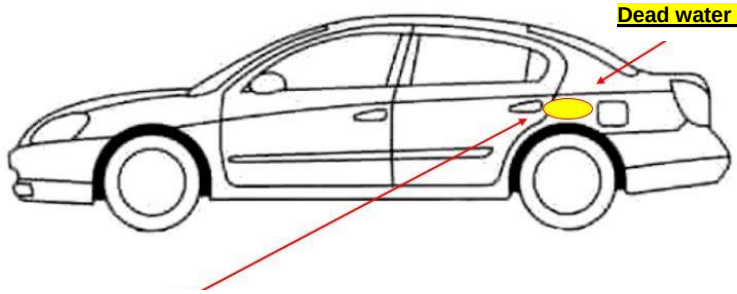

Figure 1

Figure 2

Solution:
The ICC invention aims to prevent local pollution depending on environmental conditions and current vehicle use. Thus customer complaints of local soiling can be reduced, especially in the area of the rear doors.

The idea is solved by:
- an electrically adjustable exterior mirror housing, which allows to influence the flow around a vehicle and ...
- to prevent localised dirt deposits on a painted surface of a sidewall frame and the doors etc. depending on the situation
- an outer casing which can be adjusted independently of the mirror glass orientation, i.e. the mirror glass is stationary and the game casing is twisted and adjusted

The method describes a control system that influences the flow and pressure conditions around a vehicle's strak with regard to the prevention of dirt accumulation by means of an exterior mirror housing adjustment. The flow conditions along a side wall frame of a motor vehicle are related to the position and orientation of the exterior rearview mirror. In the dead space of the flow, i.e. in the rear area of the motor vehicle, turbulence occurs at right angles to the direction of travel, resulting in dirt adhering to the paint surface, especially in the covered area around the door handle. The focus of the idea is the positive influence on a flow field, i.e. a change in the flow and pressure conditions on the sidewall frame in the dead space area via the alignment of an exterior mirror housing relative to the motor vehicle depending on ambient conditions, for example by means of precipitation detection or spray run sensing.

Theoretical detailed consideration of the dead water area / definition / state of the art:
On the windward side of the door handle on the strak, i.e. the painted sidewall frame of a motor vehicle, the wind causes abrasion, while on the leeward side, the reduction of the horizontal momentum of the downward sinking air masses causes the particles transported by the wind to fall down and settle as superficial sediments. In simplified terms, dirty airflow, i.e. rain with tyre abrasion, dust or dirt, is conducted through the mirror housing on the windward side against the direction of travel to the rear outer contour of the door handle, where it is given a twist and deposits on the leeward side, i.e. to the screw-on surface on the paint side in the area of the door handle.

Luff and lee side on an outside door handle of a motor vehicle

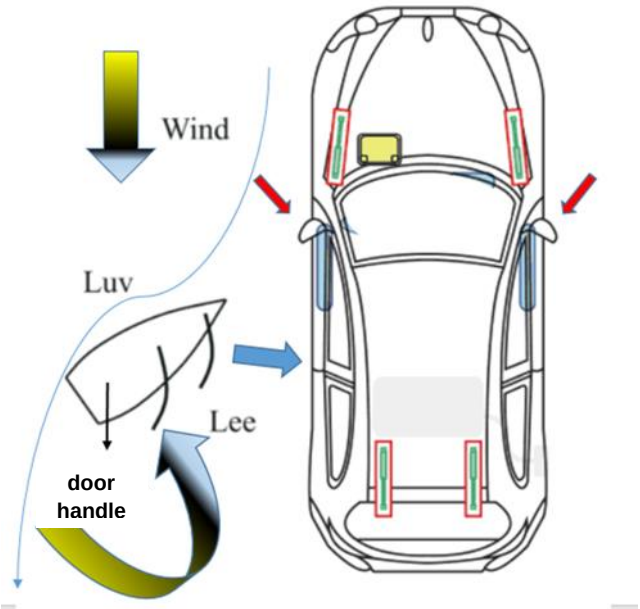

Figure 3

The task is solved with ...

- a motor vehicle according to SDT
- an ICC control unit with interface to
- a front camera and precipitation sensors
- a wipe and wash control

- Sensor data that depicts a driving activity
- an exterior rear-view mirror conforming to the SDT with an exterior mirror housing and/or of a special design
- an exterior mirror with adjustable mirror housing, i.e. the exterior housing can be adjusted independently of the mirror glass orientation

In a special design form ...

- a clip-on module can be clipped statically onto the exterior mirror housing
- a deflector edge must be statically firmly moulded/injected into the housing contour
- a module with electrical adapter housing adjustment can be adapted/integrated

Advantages:
- Guarantee of a class-compliant, optically evenly "clean" outer trim, best possible external appearance of a motor vehicle, i.e. class-compliant without local soiling on the painted surfaces of a sidewall frame and the doors
- Avoidance of local dirt accumulation on external surfaces in the area of movement of the user/passenger
- Reduction of secondary soiling of clothing items during boarding and disembarkation
- Reduction of a cW-value, a CO2 reduction by reducing turbulence effects
- Creation of a cost-effective added value through the smallest optimizations
- Reduction of customer complaints from the premium segment / risk of soiling

Possible application:
The outside mirror housing adjustment influences the flow and pressure conditions around the strak of a vehicle with regard to the prevention of dirt accumulation in the field of vision of an observer. The flow conditions along a side wall frame of a motor vehicle are related to the position and orientation of the exterior rearview mirror. In the dead space of the flow, i.e. in the rear area of the motor vehicle, turbulence occurs at right angles to the direction of travel, resulting in dirt adhering to the paint surface, especially in the covered area around the door handle.

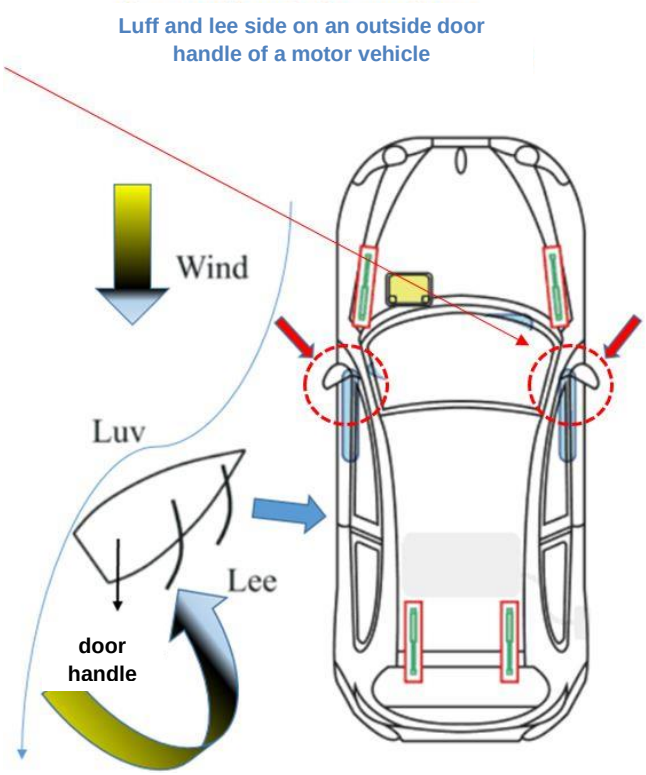

Figure 4

Design example A describes an exterior mirror housing adjustment. In this version the mirror glass is in place and the outer housing rotates and adjusts relative to Strak A, i.e. by a two-stage wing mirror adjustment.
Design example B describes a mirror glass adjustment in the exterior mirror housing according to the state of the art for observing traffic.
The exterior mirror housing adjustment according to ICC procedure serves to prevent local soiling on the sidewall frame, doors, etc.

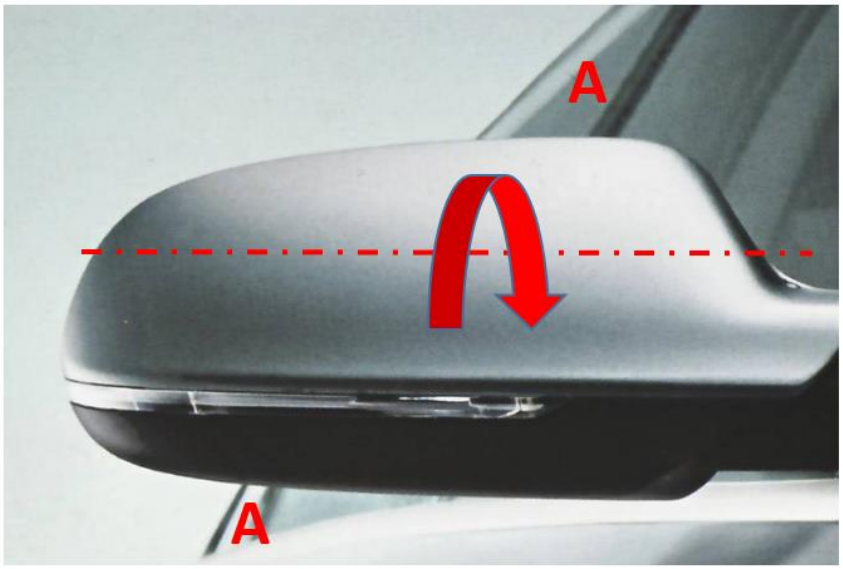

Figure 5: Design example A

Actuator integrated in the exterior mirror housing / design = deflector effect

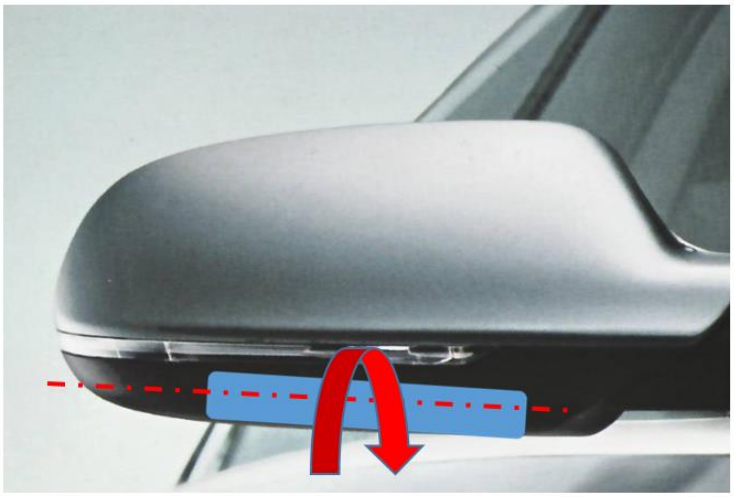

Figure 6: Design example B