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WC - WINDSHIELD CLEANING

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Technical task:
Method and control device for a threat-based assistance function for cleaning a vehicle surface, in particular the glass surface of a motor vehicle.

Initial situation:
At present, rotating wiper arms are used for cleaning windscreens and rear windows, with coupling to a wiper control and addition of wiper water. Windscreen wipers are often a nuisance when cleaning windscreens and rear windows, as they squeak, rub or interfere with the field of vision due to rotation. In addition, it may be necessary to add more wiping water in order to remove stubborn dirt and optimise the field of vision. Especially when distributing dirt through the wiper blades over the entire windscreen, repeated wiping with water is necessary to clear the field of vision. This disturbs the driver's field of vision and distracts him from what is happening on the road, which endangers road safety. The wiper blades also only clean the part of the windscreen that is reached by the arms, leaving dirt especially at the upper corners. This dirt can obstruct visibility and restrict the incidence of light into the passenger compartment, especially from headlights. Dirty side windows, mirrors, headlights or panoramic roofs, on the other hand, are not cleaned by a system at all. In addition, high-standing vehicles such as SUVs or buses require access to the vehicle by means of aids or a wheel on the front axle to be repaired. This represents an additional risk of accident.

Solution:
A solution to this problem can be achieved by a non-automotive cleaning device - UAV assistance - which is coupled to the vehicle and cleans a surface, in particular panes and glass surfaces, around the vehicle under certain operating and operating conditions.

The task is solved by a UAV cleaning assistant with multifunctional sensor technology for contamination as well as a vehicle-side glass surface sensor technology, for example a front camera, an AWC control device, an ALIC controller, a HW/SW interface between IJAV and vehicle, a mobile terminal, a user or a smartphone, which detects the contamination.

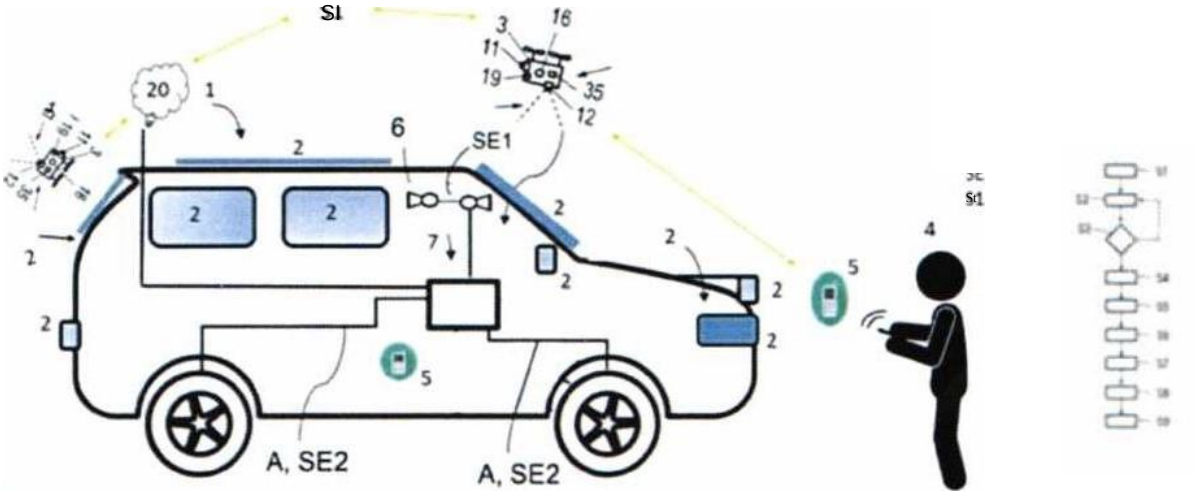
In the rest position, the assistance system is docked to a supply line as well as to one or more containers of a window cleaning agent. The function can be triggered automatically, e.g. via the sensors, without the driver having to intervene. The perception of all glass surface contamination in general on a motor vehicle can be detected by sensors on the vehicle side and/or UAV sensors (activation in the case of a certain degree of visual impairment, i.e. the presence of an actually required local and non-overlapping washing activity is advisable or manually specified by smartphone). Certain sensor-controlled operating situations (e.g. environmental conditions such as weather and road conditions or driving situations such as traffic light stop and end of journey) caused by the vehicle or IJAV as well as the measured degree of surface contamination trigger the working position. The driver can personalise the AWC assistance in a setup. Alternatively, the application can also be controlled via Smart Device. The assistance is located in the coordinate system/net of the vehicle.

The assistance system features flexible fine spraying of various cleaning fluids by a relative movement between the UAV and the vehicle, as well as a locally activated UAV high-pressure jet effect that uses a cover milling rotary nozzle, for example. An even distribution of the cleaning liquid on a glass surface is achieved by means of a UAV drive blower. The need for cleaning fluid can also be reduced by optimising the process. After ultra-fast, local wipe cleaning with local soiling, the glazing surfaces are dried by a UAV hairdryer. This is, for example, a drive and/or additional blower motor, analogous to a washing line, which supports homogeneous, uniform blowing or drying. As an option, the system can be equipped with a surface seal for rain protection. In a further version, an AWC module can also ensure a "peeling effect" with an unspecified cleaning cloth similar to a windscreen wiper blade. Finally, the cleaning result is evaluated and, if necessary, the work step is repeated. A sequential start as well as a temporary execution of the above mentioned steps is possible in any order by a UAV cleaning module.

Advantages:

- Complete windscreen cleaning assistance also outside the areas that are cleaned according to the state of the art,
- i.e. no segmental, arc-shaped or uncleaned surfaces of a windscreen or rear window
- simplified handling of full-surface windscreen cleaning and solution of cleaning problems with SUVs, buses, coaches and vehicles with high trim levels
- Partially and locally more efficient cleaning of glass surfaces
- Savings in cleaning fluid due to more homogeneous application at local points where cleaning intensity is required
- Reduced streaking by eliminating the problem of smudged dirt due to a relatively "dry rubbing" rubber lip according to the state of the art.
- No visual impairment due to water stains outside the state-of-the-art cleaned viewing segments - the entire pane/glass surface is clean
- Increasing individuality in the vehicle and added value in general

Possible application:



1 Motor vehicle
2 glass surfaces / windows / mirror surfaces / light panes
3 Assistance system - UAV Operating position
Cleaning front windscreen / drying rear windscreen
4 Users/Users/Driver
5 Mobile device of 4
6 Camera on vehicle side / front / rear / ...
7 AWC controller with personalized database 8
8 Database personification of driver assistance requests
11 Camera assistance system - UAV
12 Cleaning tanks / liquid Cleaning / sealing
16 Blower motor / heating unit from drive for 3
20 Interface 1 to 3 and 4 to 3 / Motor vehicle / User
35 Interface mobile terminal User Motor vehicle
SE1 Control signal Sensor technology Motor vehicle camera at 7
SE2 Control signal wheel sensor on 7 / standstill detection
S1 Signal distance 20 to 3 and 4 to 3