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ILLUMINATED MOLDINGS AND FRAMES RADIATOR

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ILLUMINATED MOLDINGS AND FRAMES RADIATOR GRILLE FOR MARKING AUTONOMOUS VEHICLES

Technical task:

The object of the technical innovation is to provide easily producible illuminated trim, with which you can clearly identify even autonomous vehicles to the outside.

Initial situation:

Moldings are formed from aluminum sheet or aluminum extruded profile, polished, galvanized and finally provided with protective varnish. Then they are mounted to the body.

This manufacturing process requires a lot of effort (multi-stage forming tools, long process chain, assembly concept)) with a correspondingly high reject rate. On the cost side, there is potential for optimization.

Illuminated moldings are not implemented in mass production. A clear standardized marking for autonomous vehicles with reference to active autonomous driving mode is not implemented.

Solution:

Moldings or the frame of the radiator grille are made of transparent or semi-transparent plastic by injection molding and coated by PVD coating (Physical Vapor Deposition, results in a chrome look). In the plastic component, lighting elements (e.g., optical fibers or light channels) are incorporated in-process or as an assembly solution. When the lights are off, the trim strips or frames of the radiator grille look like they used to.

When the light is on, the illumination color can be adjusted. This can be used as a new design feature for a „digital exterior design“. It also increases the safety of autonomous vehicles.

If a vehicle drives in autonomous mode, for example, the illuminated trim strips or radiator grille frames may turn red. Pedestrians and other road users see directly on the vehicle side wall or the front of the vehicle that it is an autonomous vehicle. This is important for traffic safety because a pedestrian communicates with an autonomous vehicle in a different way than with conventional vehicles.

Technical implementation

In Figure 1, the schematic structure of the illuminated trim strip can be seen in cross section. As a carrier part is a plastic part. The production of the support member is i.d.R. in injection molding. By a suitable coating method (e.g., PVD), a thin layer may be applied which produces metallic optics (e.g., chrome optics). Due to the small layer thickness or other material properties, this layer may be transparent.

Other variants are shown in Figures 2 and 3.

Fig. 2 shows that the illuminated decorative strip can also be made without coating.

Fig. 3 shows that the light element can also be back-injected directly in the injection molding process, so that an assembly process is eliminated.

Advantages:

- Increasing traffic safety by marking vehicles in autonomous mode
- Customization option „Digital Design“
- No additional lighting elements on vehicle exterior surface necessary
- Easy cost-optimized manufacturability

Possible application:

- Vehicles with autonomous driving mode
- Digital design for all vehicles

