

Lightweight construction of a loading floor with a vaulted lower side

The invented loading floor for vehicles can withstand heavy cargo without bending or breaking. The same load capacity can be reached with a lighter loading floor. The manufacturing of the loading floor is also less material consuming.

Challenge

Conventional loading floors are completely plane. They are thus basically a board which is mounted horizontally into the car trunk. When loading heavy cargo the board will start to bend and eventually break. Consequently, the loading floor has to be sufficiently thick and reinforced to withstand the desired load. This increases the weight of the loading floor which in turn makes the handling of the board more difficult and increases the fuel consumption of the vehicle.

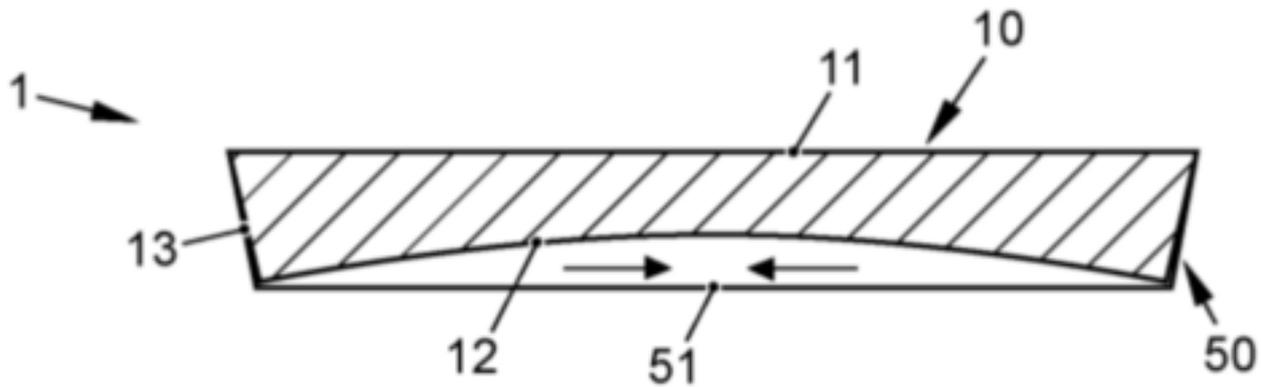
To solve this problem, vaulted loading floors have been developed. If no cargo is loaded on the board it remains vaulted. Only if heavy cargo is added, the board becomes plane. A part of the forces working on the loading floor are thus counteracted by the intended deformation of the loading floor. However, if only light cargo is loaded the loading floor remains bend which is an undesired effect. For this reason vaulted loading floors are rarely used.

Our Solution

The loading floor presented here consists of an upper and a lower part. The upper part is plain, the lower part is vaulted. Thus the lower part counteracts heavy cargo while the upper part remains plane at all times.

The new loading floor combines the advantages of the conventional, completely plane loading floor with those of a completely vaulted loading floor. The new loading floor is lighter and the manufacturing is less material consuming while it has the same load capacity and is as flexible as a conventional loading floor.

The vaulted lower side increases the available storage space in the car trunk and opens up additional space for e.g. electronics.



Loading floor (1) with vaulted lower side (12), plane upper side (11) and belt (51). (Source: Patent application DE 10 2016 112 310 A1)

Advantages

- Weight Reduction
- Less material consuming
- Easier handling
- Additional storage room

Application Area

- Cars
- Planes
- Ships

Developmental Status

The weight reduction and the load capacity have been verified in simulations.

Patent Status

German patent application: [DE102016112310A1](#)

International patent application: [WO2018007208A1](#)

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