

Self-Driven Storage for Medium to Large Size Parts in a Production Line: "A Storage on Wheels".

Background

Today's developments in the field of production processes are aimed at economical manufacturing of the latest generation of vehicles - in a large number of variants (e. g. electric version) - in a highly flexible production and logistics system. These developments are meant to enable parallel production of different model series on the same production line. In addition, they allow for quick and easy changes when it comes to special models and optimizations or problems, such as short-term bottlenecks in the supply chain. They require nothing less than a revolution in conventional production processes. Only by using innovative aids, such as driverless transport units and the appropriate storage and handling systems can changeable manufacturing be realized.

Flexible handling of bulky assemblies in particular is a challenge that the storage concept presented here can meet.

Problem

Today's production processes in the automotive industry are still linked to rigid transport routes and sequenced processes. Making spontaneous changes or adapting the production line to a new model series always means spending a lot of time and money. For example, if parts are missing from the assembly line, rework can only be carried out when the assembly has reached the end of the sequence. This can make reworking and special requests extremely time-consuming and expensive. This is why more flexible systems are required to meet the demand for individual solutions and innovative concepts.

Solution

The flexible shelving system described here was developed as part of the Baden-Wuerttemberg (federal state in Germany) funded research project "FlexProLog - Realignment of Production Logistics for Automotive Manufacturing and Affordable Electromobility" at the Institute of Mechanical Handling and Logistics at the University of Stuttgart. It allows for a flexible transfer of parts or assemblies, such as an underbody assembly, bodywork or entire vehicles, into and out of production. The units of its "dynamic storage" are modular and can therefore be used independently of component dimensions. The innovative shelving concept is completed with the integration of a loading system with an elevator platform and its own omnidirectional drive. It is practically an autonomously movable shelf of any size. Each unit serves as a space-saving intermediate storage and/or can be used when changing one or more assemblies between production areas.

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Patent Situation

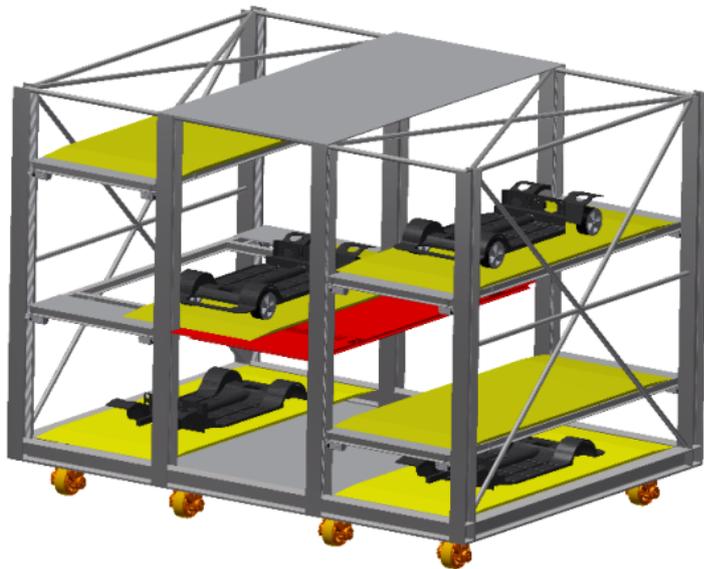
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Service

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CAD 3D model of the dynamic storage [University of Stuttgart].

Advantages

- Shelf with adaptive units
- Self-propelled large load carrier
- Mobile, flexible & scalable
- Integrated omnidirectional drive technology
- Integrated storage and retrieval technology
- Temporary storage of vehicles possible, independent of the assembly stage
- Unmanned removal of finished vehicles from the production line possible

Application

Transport and storage solution for modern & flexible automotive production. In combination with another development of the institute (15/059TLB), a matching the multifunctional variant of a driverless transport vehicle (AGV), this will become the basis for the highly flexible automobile production of the future.