MOBILE DEVICE FOR CLEANING PROCESSING MACHINERY

Versatile and mobile – Cleaning for Industry 4.0

The Fraunhofer IVV Dresden has developed an innovative mobile cleaning device which combines the versatility and efficiency of manual operator cleaning with the reproducibility and reliability of permanently installed CIP systems.

The cleaning device is placed on a machine conveyor belt which transports it to the areas to be cleaned. Using an extensive sensor system, the device can detect its current position, the geometry of the surroundings, and the nature of the contamination.

Based on this, the self-learning system selects suitable nozzles, parameters, and cleaning routines and effectively cleans the machinery.

As such, the cleaning process does not have to be set up for a worst-case scenario and the weakest link in the chain no longer necessarily determines the total cleaning time. The optical contamination sensor allows total quality control and full documentation of the cleaning process.

The cleaning device is controlled via WLAN and energy is supplied via batteries. The only physical interface is a hose which supplies cleaning media such as water and foam to the cleaning device.

The hose reel with automated rolling in and out of the hose is located in a mobile docking station, from where the cleaning device travels to the machinery. The docking station means that the cleaning device can be used in a versatile way for cleaning multiple machines at a company.

For applications without a conveyor belt there are self-propelled options whereby the cleaning device can be either attached to wheels or be self-driven.

In collaboration with you we can also develop solutions to meet your specific needs.
Features at a glance

- Versatile, efficient, and reproducible cleaning
- Position detection for orientation in the machinery and independent selection of the cleaning program
- Optical contamination sensor for targeted cleaning
- Self-learning system - continuous optimization
- Storage of cleaning protocols for documentation purposes
- Driven by batteries and controlled via WLAN
- Separate control of various nozzles
- Can be used for several machines with the aid of a mobile docking station
- Transport via conveyor belt or self-driven

Looking to the future – virtual twin

Intense R&D work is underway at the Fraunhofer IVV Dresden for automatic identification of optimum cleaning parameters via simulation using CAD models.

In order to further improve the adaptivity of the mobile cleaning device, the cleaning systems will in the future be linked to a virtual twin of the machine to be cleaned. This virtual twin can be generated by CAD data or 3D scans.

Based on this, the cleaning device in combination with data from the contamination sensor will accurately determine where the contamination is on the machine surface and the distance of the contamination from the nozzles. With the aid of simulations, the optimum operating parameters for effective cleaning can then be determined and any areas with residual contamination can be cleaned.

In this way the cleaning device operates completely autonomously and no prior programming of set cleaning routines is necessary.

You are most welcome to contact us!

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