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AUTOMATIC POWDER DISCHARGE SYSTEM TO AVOID POWDER AGGLOMERATIONS WHILE LOADING

HP INC

Automatic Powder Discharge System to Avoid Powder Agglomerations While Loading

Overview of the system

Powder base technologies and systems which integrate powder as main material to work with, are more common nowadays. In the following article a system to discharge powder agglomerations in the discharge hose from a processing station or loading device will be explained.

Due to some powder accumulations during the loading process where some amount of powder could remain in the flexible hose, some loading and cleaning processes issues could happen. If powder accumulates to the hose inlet at the beginning of the component, a severe error could appear.

Which are the problems that this system solves?

The presented solution solves issues related to material workflow avoiding clogs in the discharge hose during the loading process. At the same time, this solution also avoids non-wished powder in the processing station after loading process

For similar components and scenarios this solution offers the chance to avoid severe errors due to powder accumulation till the inlet or hose extreme

How does the systems work?

This article collects information about an automatic system to avoid any chance of powder agglomeration through the whole hose length. This issue could appear in case there is some displacement or non-wished angle in the hose way.

The current system implements a hose with an extensible metal cable which allow limited movement with the ability of coming back to the homing or repose position.

This system implies an automatic process to allow certain movement in the discharge hose during the loading process in case a bad hose placement or angle appears.

Inside the processing station and close to the original extensible cable there could be a second one connected to the middle of the hose providing some quick movements originated by a servo motor.

Figure 1. Illustration of a servomotor

If the system detects any possible agglomeration detected in the discharge valve from the mixer system, instead of generating a system error and stopping the whole process and sequence of movements could start while the discharge tap connected to the build unit is totally open. This way we ensure there is no powder along the hose path.

The sensor that detects the powder presence at the top of the hose would act in the same way, but the next actions would be as described previously.

Which are the advantages on doing in this way?

- Reduce customer escalations.
- Improve the loading process since some quick discharges could be implemented periodically while the process.
- Avoid certain level of remaining powder in the hose after finishing the loading process.
- Improve processing station and cleanliness

Are in the market other kind of solutions?

There was no automatic prior solution. The system stops immediately after detecting certain level of powder along all the length of the hose, being filled then completely with powder.

Disclosed by Miguel Vega, Alejandro Torres and Eduard Galdeano. HP Inc.