Strong bags holding 15 to 30 kg have established themselves on the DIY market and in the semi-professional sector for packing plaster, lime, cement and building materials in powder form. They are reasonably priced, can be filled completely, are practically dust-proof and can be transported stacked in several layers without any problems. However, they make greater demands on packing machines because the bags are too large and too heavy for conventional chamber or computing systems. The leading manufacturer of packing machines for small containers up to 10 kilograms in the building powder sector, the FAWEMA Maschinenfabrik GmbH & Co. KG in Engelskirchen-Ründerot near Cologne has transferred the principle process of its machines to a modular system for larger bags.

**Filling, shaking, folding and sewing ...**
Because the bigger bags are no longer held at the top edge and transported suspended through the plant, FAWEMA has developed a cassette system which picks up the bags, guides them from the side and adapts to different sizes.

In the preparation for filling, the bags are picked up from magazines by grippers, inserted in the cassettes, opened and transported underneath the product-specific filling nozzles. There a lifting table moves them up into the filling position. Then the already pre-proportioned product stored in silos is filled. The lifting table moves down as the filling level rises, whereby the bottom edge of the filling pipe always stays below the product level. Two consecutive shaking stations compress the product. After shaking, the cassettes are positioned underneath the folding head which then pre-folds the sack closure. A roller track section turns the cassettes 90 degrees and transports to the sewing machine which seals the bags. Another station turns the cassettes back to their original position. A slide pushes the ready-to-ship bags out of the cassettes onto a roller track. At the end of this track the standing bags are pushed over and onto the discharge whilst the cassettes are rolled back to the collection point. The weigh of the bags is checked finally. Bags outside the tolerance are automatically ejected.

**Homogeneously automated with Simatic**
The system is controlled by Simatic S7-416-2 DP which communicates via Profibus DP with the individual servo axes, the isolated valves, the digital inputs and outputs of buttons and initiators and via a DP-DP coupler with the user’s process control system. A PC-based system under Windows CE should be used for operation and monitoring (HMI), a requirement for which FAWEMA has implemented the Multi Panel Simatic MP 370 with touchscreen due to the very wide scope of functions. A Simatic TP 170B Touch Panel which uses the (filtered) database of the MP 370 has been installed additionally at the tooling station inside the system. Touch Panel, Multi Panel andController are connected by the multipoint MPI interface. This produced a homogeneous, distributed automation with a uniform database which cut down on engineering work.

**Reliable and intuitive user guidance**
Thomas Krimmel, Head of Electrical Design at FAWEMA cites the enhanced fail safety as an essential argument for the homogeneous operation.
Flexible and cost-effective in global industrial application
Because FAWEMA exports the majority of its packing machines, telemaintenance is very important even though the customer “only” wanted to use the regular teleservice interface of the controller and the Multi Panel initially in this case. However, telediagnosis via TCP/IP by means of the integrated Fast-Ethernet interface of the MP 370 which also opens up the gate to the office environment is being specified more and more frequently. The operator language can be changed at the press or touch of a button for worldwide applications. The MP 370 has a command of various Asian languages such as Chinese and Korean as well as all common European languages. Since the HMI system is installed in a rotating, swiveling control desk on the machine, the compact, rugged design of the Multi Panel Simatic MP 370 was welcomed.
Siemens support for configuration was initially required. “Cooperation was exemplary”, Krimmel praised. “We defined our needs and the Siemens Application Center in Cologne configured the core of the application. We only had to add the details.” With growing experience in configuration under Simatic ProTool, FAWEMA will implement future applications themselves and exploit the advantages of a single, homogeneous platform for all Simatic HMI devices (Human Machine Interface) to reduce the time and costs of engineering even further. “We will be able to take over a large part of this successful configuration in the next packing machine of the same type”, Krimmel sums up.

Published in:
drive/switch and control 3/2002