

Cameras as counting machines

CAMERA SYSTEMS ACT AS COUNTERS AMONGST OTHER THINGS AND MAKE SURE THAT THE APPROPRIATE NUMBER OF PRODUCTS GOES INTO THE PACKAGES



++ figure 1
The camera records quantity and location of the incoming bread rolls and places appropriate blocking bars in order to obtain the proper quantity in the package

++ figure 2
Transparent belts not only count the product, but also check the size and shape and sort out imperfect items

++ figure 3
Homburg is famous for its sturdy forming, filling and sealing machines with integrated counters for small and large packages that are able to count up to 30,000 pieces per hour and guide them into the bags

++ figure 4
Bulk bread rolls are sorted into rows before they are counted by infrared sensors. Retaining bars are also used here



+ Soft rolls, baguettes, raisin rolls or tender croissants – the camera doesn't care what it counts. The most important thing is that the shape does not differ more than 30% from the standard. Even when different types of pastries fall randomly onto the conveyor belt from the oven or the freezer, the camera keeps everything in its view. It is an integral part of a camera-controlled counting machine which is included in the product portfolio of the Homburg engineering plant, Wuppertal, Germany. Upstream of the hoppers or guide rails, which direct pastries into the packaging machine, the optical recognition system observes the situation on the conveyor belt and therefore each individual product repeatedly at frequent intervals. In this way the system recognizes the shape, location and the distance traveled by the product on its transport towards the packing section and registers all the information. When a sufficient number of products for one bag pass a hopper, bars move down and block the transport until a new packaging unit is ready for accepting the products while the other products just move on. Careful monitoring ensures the bars cannot crush or damage the product. They move down at just the right time.

If the camera recognizes an object on the conveyor belt which deviates in shape and/or size from the specifications, perhaps for example if the initial dough weight was incorrect or two pieces have stuck together, the camera ensures the product is safely navigated from the belt. The discharge is either done by "shooting it out" with compressed air or by "guiding it" via flap onto a separate belt for future disposal. The camera-controlled counting machine

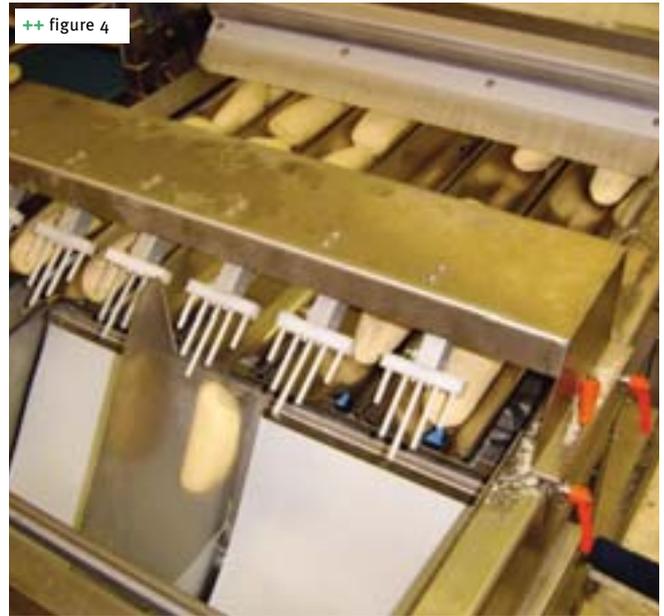
handles a maximum of 100,000 products per hour at a maximum of 30 cycles per minute. The standard version of the counting machine can store the information data of up to 99 products. More product files can be stored on a memory card (PCMCIA format). Connection to the PC in production control is also possible without experiencing any problems, as well as data transfer and the documentation of the packaging performance.

The system has been extended with the possibility of integrating quality control features. Homburg's CEO, Stephane Vieira explains: "There is no room for defective products in the package. Sorting by hand is cost-intensive and clearly less reliable than an incorruptible camera." Homburg's quality control system includes color contrast check, shape and size control and error check. The integration of a metal detector or an X-ray unit is optional. In this case, the products run on a transparent belt. One camera checks the product from above, the second one from below. The processor combines the data transmitted from the cameras and decides whether the observed product meets the specified requirements, standards and tolerance limits – repeatedly in this case – and decides whether the products can be forwarded to the packaging unit or should be rejected. The computer also provides statistics and data for the optimization of the production process.

Homburg GmbH, based in Wuppertal, is an international specialist for the planning, development and installation of automated counting, weighing, measuring, quality control, bagging, packaging or palletizing systems for the food industry. The company was founded



++ figure 3



++ figure 4

more than 35 years ago and first specialized in packaging material and equipment. In 1988, Homburg developed and manufactured its first packaging machines. In 2003, the management was handed over to the new owner Stephane Vieira, who, since that time has been the sole managing director. Today there are 20 employees working at the head office, based in Wuppertal, Germany. The portfolio of prod-

ucts has been expanded considerably. Homburg works together with the French company De la Ballina Industries, Maleville, France, which produces similar technology. With an 80% export share, the most important foreign markets are France, the Benelux Countries, Spain, Australia, Sweden, USA, Chile, and Mexico. Homburg has a worldwide net of partners for individual consultation and customer service. +++

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