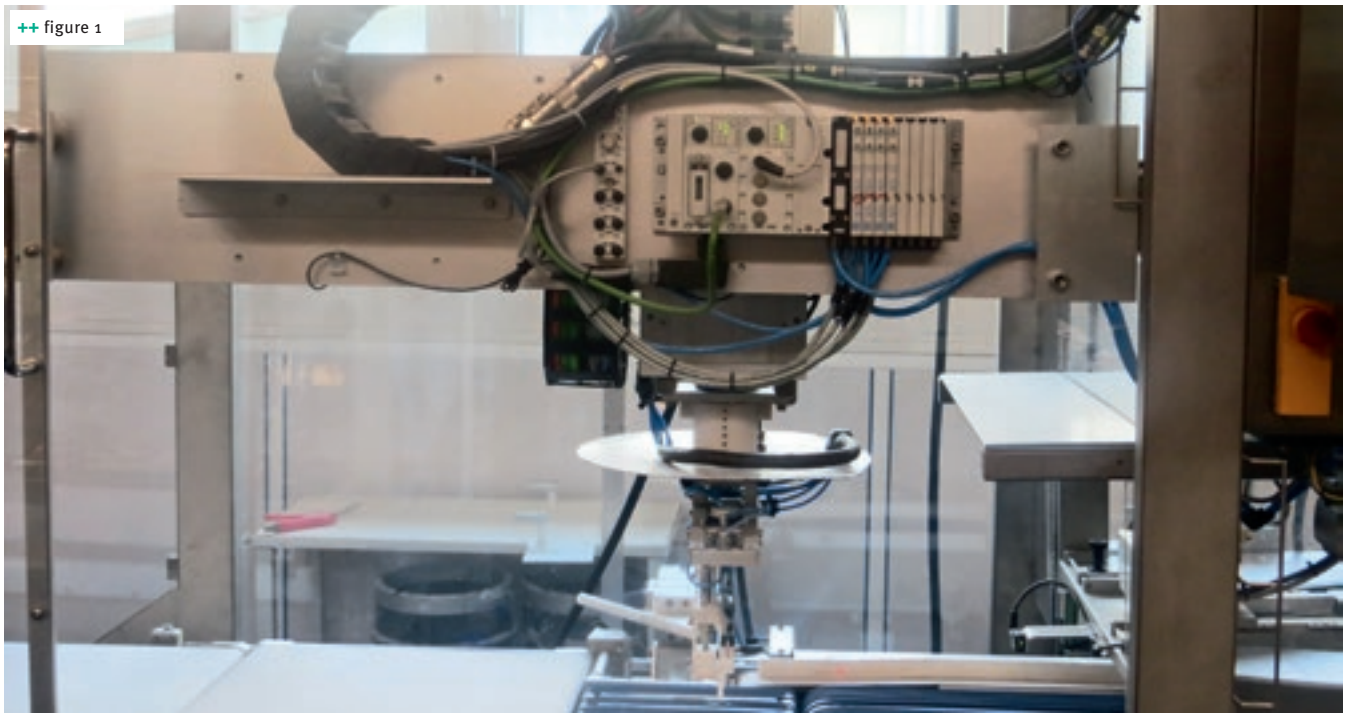
From practice for practical use

OSWALD PILLER IS A BAKER AND AMATEUR MACHINE BUILDER. THE ADVANTAGE OF THIS IS THAT HIS IDEAS ORIGINATE FROM ACTUAL PRACTICE AND HIS MACHINES ARE TRIED AND TESTED IN PRACTICAL USE

++ figure 1

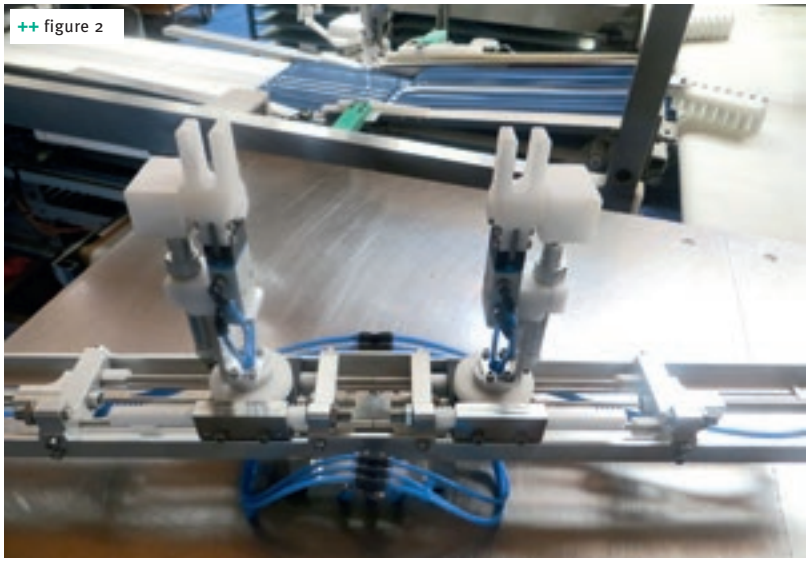


++ figure 1
The twist head with linear motor drive

If Oswald Piller was a Goethe fan he could sigh "Two souls alas! are dwelling in my breast," but his double talents are no reason at all for sighing, and only his jealous competitors might call him Faustian. The reason is that the 56-year-old Master Baker from Karlsfeld near Munich, Germany, is doubly successful at the same time.

In the first place he operates a bakery in which his father had already specialized in the manufacture of Bavarian pretzels. An important pillar in this business are the big varieties with an initial dough weight of 350 g, which are simply an essential feature at the Oktoberfest, in beer gardens and even in Bavarian households because due to their larger proportion

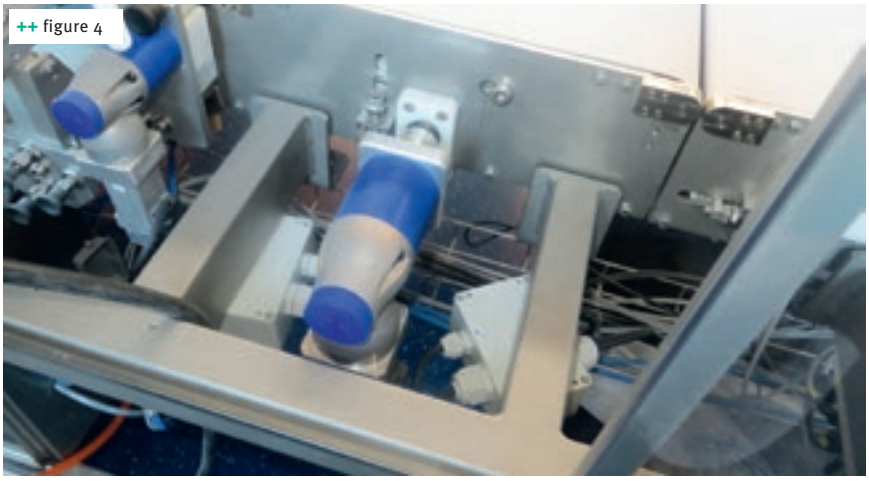
++ figure 2



++ figure 2
The patented twisting arm whose grippers turn through 90° after the rotation that makes the knots, to press the arms onto the body of the pretzel

++ figure 3

++ figure 3
Oswald Piller, owner of the Piller bakery



© fzm

++ figure 4
The direct drives for the belts are encapsulated for hygiene safety

of crumb they provide more succulence and a more balanced flavor than the small ones. Of course Piller also produces the latter, really Bavarian, with a uniform thickness and chaotically cracked surface. This distinguishes them from Swabian pretzels, whose body is thicker than the arms, and are also slashed before being baked. Oswald Piller took over his father's bakery in 1982 and has enlarged it. Today up to 50,000 pretzels per day are knotted, coated with lye and frozen, not just from March to October but almost all through the year, in two shifts or sometimes even in three shifts depending on the weather. 60 % remain in Bavaria and the rest of Germany, and 40 % are exported. Because pretzels have long been a successful global product, Piller also has a factory in Miami in the USA with two lines producing pretzels that sell like hot cakes in the hofbräuhauses and "Bavarian beer gardens" there. That is one of Oswald Piller's careers, which he is slowly but surely passing on to his children. His daughter Diana already works in the distribution part of the business, and his son Franz is just completing the master school in Locham.

Oswald Piller's second career is as an amateur machine builder, and it is no less successful. As a rule the triggers for his developments, which he makes ready for series production in his home workshop and then has fabricated by specialist machine constructors, are problems that he sees in his own bakery or in those ▶

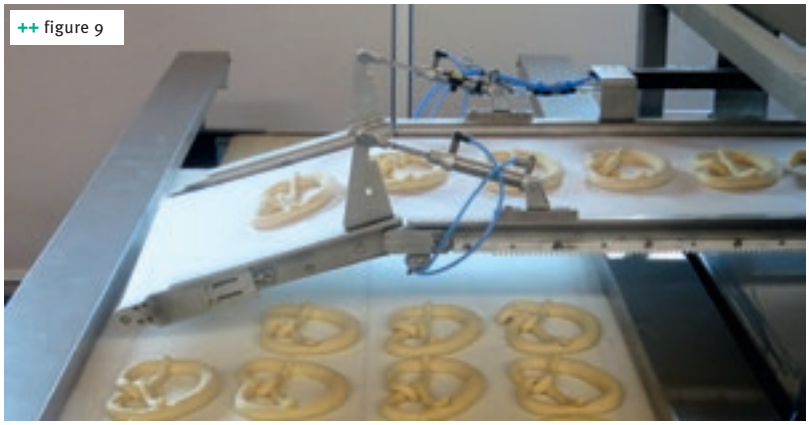
© fzm

++ figure 5
Big pretzels are the real heroes in Bavarian beer gardens. Their great freshness, succulence and flavor are impressive

++ figure 6
The strand leaves the strand roller

++ figure 7
The strand leaves the strand roller

++ figure 8
Fully knotted pretzels



++ figure 8
Automatic deposition

belonging to colleagues, or alternatively processes for which automation is appropriate. One example of his developments is a refrigeration plant which, assuming the corresponding air-conditioning technology, can be used as a resting zone, chiller, freezer or even as a proofing plant. His own bakery contains a single-track and a twin-track example of this, which are used for freezing pretzel dough pieces. After lye-coating, the latter are deposited onto a wire mesh belt and pushed into the freezer, in which seven belts one above the other are ready to receive them. The loading station docks onto one end face of the plant, and opposite to it is the exit, both with narrow openings from which little cold can escape. What makes the plant so efficient is the fact that the loading and unloading points are installed at a height of more than a meter, thus the whole of the interior space up to this height provides a static cold zone. This in turn is good for the product surfaces because it prevents them forming a skin, and is also good for the wallet because it is energy-efficient. When a belt is full it is cycled downwards. When all seven belts are full, the 21 m² of refrigerated surface can accommodate around 3.000 pretzels. The first have then already received 20 min of refrigeration and are frozen all the way through. The cycling reverses, the first belt is unloaded and refilled from the other side. The belts and air-conditioning plant are fully removable from the cell so they can be cleaned without problems, and if necessary they can also be used in another air-conditioning cell. Piller is currently working on a plant in which bread dough pieces deposited in pans can be cooled down to 8–9 °C within 15 min. The hourly capacity of a single-track system is up to 6,500 pieces.

It's no surprise that machine constructor Piller's second passion is automatic pretzel twister. He obtained his first patent in 1988. The machine in service today in his own factory and in around a dozen others is a sustained development of it. The latest achieves a twisting capacity of 2,600 pieces/h with a piece weight of 90 g. A strand roller developed to match it, in which strands run gently under pressure boards on two levels 5 m wide, can even deliver 3,000 pieces/h. They are measured and positioned twice before moving to the twist head. Of course the plant's star performer is the twist head, which in the latest version is directly driven by linear motors. Compared to rotating systems, linear motors have a very short response time, a high pulse power which is converted into acceleration,

++ figure 10

© f2m

++ figure 10
A glance into the chiller

++ figure 11

© f2m

++ figure 11
The outlet of the chiller

and a small energy demand. In the current twist head they replace the usual slower pneumatic power transmission system.

The controller for the refrigeration plants and for the pretzel twister was developed by Guido Gimberg and his GriPS Automation GmbH in neighboring Oberhaching. The touchscreen shows even untrained operators what is currently happening, and if there are malfunctions it creates saved documents giving instructions about how these should be rectified. As an alternative option, a modem supplies a connection to remote maintenance via WLAN, telephone or mobile phone if necessary. Piller can already supply the whole plant consisting of a strand roller, supply system, twist head and automatic depositor with an hourly capacity of 2,600 pieces for less than EUR 300,000, and there is strong demand not only from Europe. +++