Uniform drawing of slivers with integrated automation

Best Spinning Results Guaranteed

Staple fibers first have to pass through a complex process on the way to high quality yarn. The draw frame plays an important role in quality production here because all failures in the drawing frame sliver turn up again in the yarn. In order to meet the related high automation requirements, Siemens offers a high quality solution. A mature automation concept with Simotion and Sinamics has many benefits for the machine.

Six to eight slivers from the card are fed to the draw frame through an infeed gate. There they pass a measuring device which measures the sliver thickness. The measured values are buffered, evaluated and sent to the drawing machine as a speed setpoint at the right moment. There the slivers are drawn into a single sliver of constant thickness. The faster this regulating process is performed, the better the sliver quality. At delivery speeds of 1,000 meters per minute, great demands are placed on the automation solution.

Efficient drive concept

Up till now, all drive tasks have been accomplished by a central asynchronous motor. Gears and the appropriate change gear wheel which allowed individual adaptation to the technological requirements were used to set the different speeds. On regulating draw frames there was also a regulating drive which regulated the sliver thickness to the desired setpoint. The modern automation solution consists of four single drives which interact according to the required functions. The resolution of the rigid drive assembly opens up possibilities as yet unknown. For example delay values can be set which were not previously possible because the teeth on the change gear wheels only allowed integer values. All speed settings can be made quickly without using tools, even from the foreman’s office if necessary.

Prior to spinning, the fibres are parallelized in the draw frame

One step ahead with Simotion and Sinamics

The task of the automation is to guarantee exact speed synchronicity of the four drives — especially at machine start and stop and in the event of a power failure. The Motion Control system Simotion D and the Sinamics S drive system offer a fully integrated automation solution from one provider which is tailor-made to ideally meet these requirements. Logic processing, movement and drives are integrated on one platform; the user only needs one simple engineering tool for control and drive. Simotion also offers the advantage of multi-axial drive control. The double axis modules used on the regulated draw frame save costs. The proven DC-bus means that kinetic buffering is not a problem either. Mechanics can also be reduced.

The space required for the switch cabinet is a decisive factor for all textile machines. The small dimensions of Sinamics are therefore an advantage. With the Drive Cliq interface, Simotion/Sinamics offers even greater benefits: The highly efficient interface is responsible for data exchange between the Sinamics modules and can also be used for remote diagnostics. That is important because the spinning mills are to be found above all in India, Asia or China. In these countries, safety in the event of power fluctuations and a good short-circuit-ground short-overload protection is very important. These requirements have naturally been considered in the development of the Sinamics series.