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Flexible Compression Spring Manufacturing with High Productivity

The claim to be developing machinery concepts that address the widest possible range of applications in the target group is definitely not new, but must be viewed in a different light given the prevailing conditions in a global market. Against this backdrop, the new machinery concept embodied in the FSE 15 from WAFIOS AG is impressive.

The approach is based not only on a modular design, but rather on a concept which, through an offering of numerous options, presents the ability to define a completely new machine variant to satisfy a customer's individual needs, addresses the largest possible target group and which can be used cost-effectively under completely different economic conditions.

The new FSE 15 is designed for wires ranging from 0.16 to 0.6 mm in diameter. As mentioned, the numerous options available make it possible to create a number of different machine variants. To illustrate this concept more clearly, WAFIOS will be exhibiting the FSE 15 at the Wire in two versions: The standard version linked with a spring-end grinding machine, the maximum in the form of a stand alone solution.

Compared to other machines with the same processing capability, the small footprint is a significant and obvious feature. This translates into not only improved machine handling, but also simplifies integration of the machine into existing production lines, e.g. when replacing, exchanging or adding equipment. During development, similar emphasis was placed on providing very good accessibility from all sides.

The basic version is characterised by a lean, sophisticated machine concept, yet retains in this minimal variant its functionality as a fully capable, state-of-the-art compression spring production machine. Depending on the intended use, the capability of FSE 15 can be expanded, be it in terms of handling, ease of use or, for instance, with regard to zero-defect production through incorporation of optical monitoring systems.

Regardless of the options selected, the FSE 15 does not need a blower or air-conditioning unit. The resulting reduction in air turbulence significantly cuts down dirt build-up and energy usage and increases availability as well.

The basic version of the FSE 15 features one pair of feed rollers; depending on the wire size range (up to 0.6 or 0.8 mm), an additional pair is optionally available upon request. The number of axis varies from 4 to 7 at the final expansion stage. A powerful industrial computer provides the basis for control and programming of the machine, while a standard video screen, keyboard and mouse serve as the operator interface. An industrial-grade touch screen is available as an option.

For the first time, the powerful straight cut capability can, upon request, be replaced with or expanded by an additional rotating multiple-cut capability. The "parallel pitch" feature is a further option. This gives the machine operator two pitch possibilities: vertical or parallel for use as needed. Both the multi-cut and pitch variations have been added to the reliable FSE control. The operator can program the spring geometry in tabular form; a program at the level of the NC code is not necessary.

Mandrel positioning pneumatically (horizontal) or via jog-wheel (vertically) is standard. Operation via servo motor represents an additional possibility that improves user friendliness noticeably and is especially useful in the upper operating range of the FSE 15.

With a view toward zero-defect production, sorting chutes and optical length measurement are important additional options. The FSE 15 has a newly designed pair of feed rollers with lower-profile wire guiding and recessed mounting bolts; allowing the viewing angle of the camera to approach the tooling closer and thereby improve the camera's performance and accuracy considerably when producing short springs.

Fig. 1. FSE 15

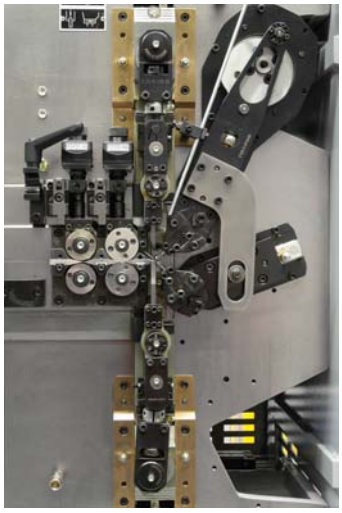

Fig. 2. Tooling area