Set-up time killer or mini-machine?
The Multi Processing Unit from HOMAG

The greater the number of different processing operations which have to be performed on a workpiece, the higher the necessary number of tools and units. The Multi Processing Unit "replaces" a large number of units and enhances drilling flexibility – all without wasting valuable time for tool set-up.

A processing center featuring a trimming spindle, tool changer and drilling head is the generally accepted standard set-up in the woodworking industry today. These processing units form the basis for a high level of flexibility. The trimming spindle is used for the exchange of different tools for drilling and trimming operations, and a comprehensive range of units is also available for sawing, edge banding and so on.

Tool change during drilling operations

However, as every tool or unit changeover entails a certain amount of set-up time, nowadays the attempt is frequently made to execute a tool change while the drilling head is in operation (**Fig. 1**). Where drilling cycles take just 2 seconds to complete, the tool change process takes substantially longer than the drilling operation itself.

Multi-spindle technology

One alternative method is to use two trimming spindles with two tool changers. This allows tool changes to be completed while the second trimming spindle is at work (**Fig. 2**). However, this solution not only entails substantial added cost but also creates a greater mass, with all the associated drawbacks – in particular when working with extension arm

machines where both trimming spindles are positioned on one side (extension arm torsion).

Supplementary units

A lower-cost variant is to add supplementary units with their own drive system. In this case, the most important sawing and trimming units are additionally mounted and any tool changes may have to be conducted manually. As a rule, the supplementary units are not equipped with a C axis, meaning that they are generally only capable of sawing operations parallel to an axis, horizontal drilling or grooving.

Drilling head

As rectangular furniture components require not only sizing and hole series or construction hole drilling but also grooving, many drilling heads nowadays feature an integrated grooving saw. However, neither the drilled holes nor the grooving saw can be applied at any optional angle, and this type of integrated grooving saw is able to offer only a minimal cutting depth and performance. The only way to perform drilling operations at a 45° angle or snipping cuts is to revert to units from the main working spindle.

Multi Processing Unit

In its MPU (**Fig. 3**), HOMAG unites the functions of a 30-spindle drilling head (20 vertical spindles, 10 horizontal), a sawing unit, an additional trimming spindle (**Fig. 4**) and drilling units in a single unit with a 360° swivel capacity.

When producing a cabinet side element, this allows for instance the following processing operations to be executed without a tool change:

- Series hole drilling
- Construction hole drilling
- Horizontal drilling
- Sizing cuts
- Finish trimming
- Rear wall grooving

The working spindle may also be used if required for edge banding and finish processing. Using additional units, operations such as 5-axis processing or traced front profiling are also possible.

Productivity increase

In ideal cases, no time loss is encountered for tool changing when using the MPU in conjunction with the working spindle. With an average of 300 – 500 tool changes per shift, this corresponds to a time saving of at least 35 minutes, based on a minimum tool change time of 7 seconds, compared to a conventional processing center with one working spindle and a drilling head.

Under the bottom line, this provides a productivity increase of around 10%, without taking into account the additional application scope offered by the facility for swivelling the entire unit, for example when drilling triangular side elements.

The MPU is available for all the HOMAG AG machine series. Distinctions already conferred on this pioneering development include the Innovation Award at this year's Novelty Symposium at the LIGNA+ 2007.

Fig. 1:
Tool change during drilling operations

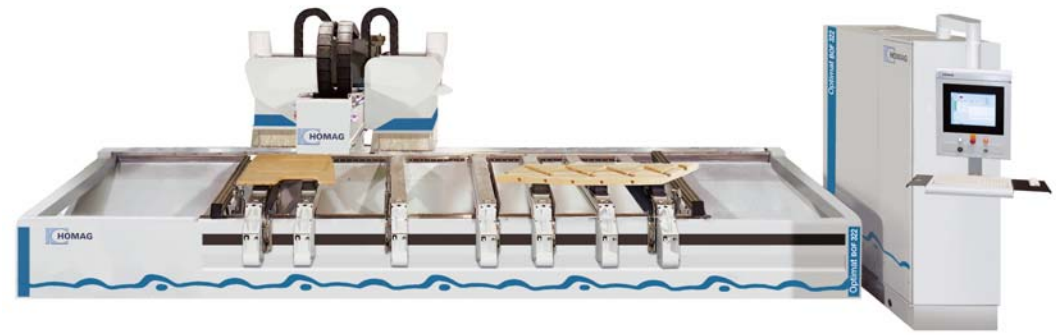

Fig. 2:

Double spindle technology for fast tool changes

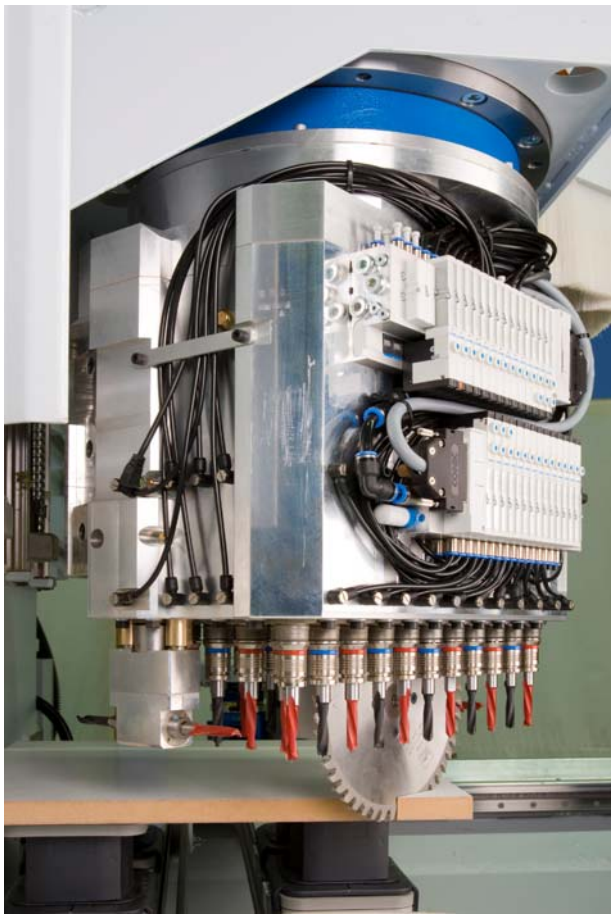

Fig. 3:

Multi Processing Unit MPU

Fig. 4:

Trimming spindle of the MPU

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