

Machine simplifies screw joints

A NEW PROCESS and machine, developed by Castle Tool Inc., Richmond, CA, is designed to simplify and improve the construction of screw joints in a wide range of applications. According to Max Durney, an owner of Castle Tool and developer of the machine, the machine allows for precise screw joinery because it separately routs a mortise for screw placement and drills a pilot hole for the screw.

That two-step process is where the Castle mortise machine differs from other machines used primarily for face-frame construction. Durney says the majority of these are step drills that drill the groove and pilot hole from the same angle.

The Castle mortise machine operates with a router head moving up from the bottom of the workpiece to rout a mortise for placement of the screw. The pilot hole for the screw is drilled from the edge of the workpiece.

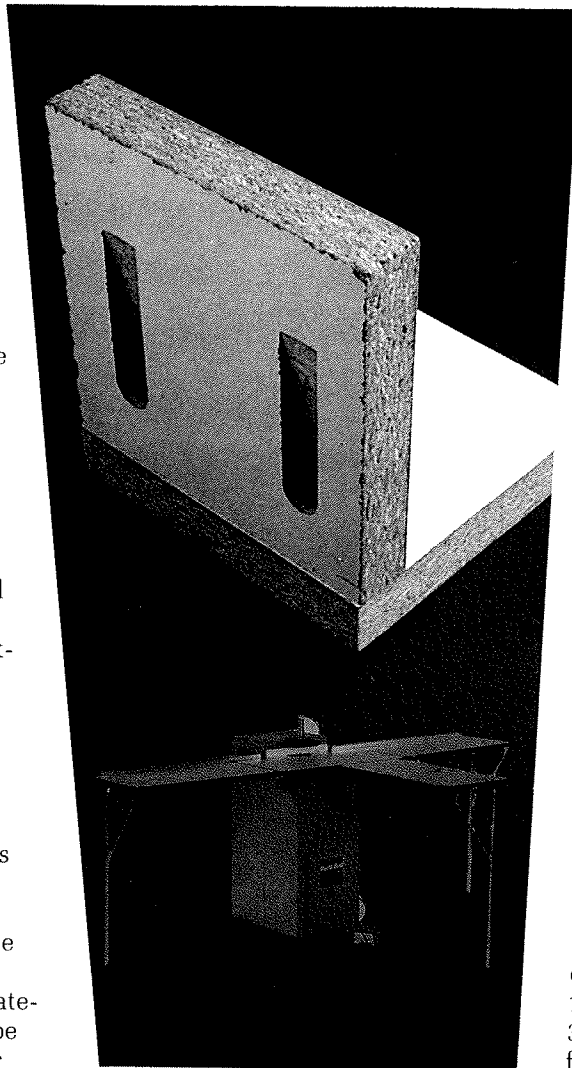
"If you're drilling from the bottom side, the drill can wander," says Durney. "With this system the drill enters the workpiece at the exit point of the screw, so it's always within a couple of thousandths of where it should be."

Durney says step-drill systems drill the pilot hole at approximately an 18-degree angle; the Castle system drills the pilot hole at a 7-degree angle. The lesser angle eliminates much of the material shift associated with this type of joint and reduces the need for clamping jigs.

The reduced angle also allows the machine to be used for much more than face frame construction. Durney says the process works in solid wood and panel materials, such as laminated particleboard and MDF.

"This system allows someone to

A new machine allows for fast, accurate screw joints in solid wood or panel materials



The Castle mortise machine routs a groove and drills a pilot hole for a screw in a two-step process. The low angle of the pilot hole reduces material shift and eases clamping.

get into European box construction without a big investment in boring equipment," Durney says. He explains that one panel can be mortised on the machine and attached to a second panel with self-

centering screws. Durney points out that in this application, the screw is being driven into the face of the panel, rather than the edge, for a stronger joint. This also reduces chances for delamination or swelling.

The joint can be made with screws alone, or in conjunction with other systems such as dowels, biscuits, or rabbet joints. After assembly, any exposed mortised panel surfaces can be covered with laminate.

Durney says the system is being used in many applications. He cites examples such as attaching wood edges to countertops, backsplash attachment, toe kick assembly, face frame assembly, door assembly, and other uses in both traditional and contemporary cabinets.

"Screw joinery can be an efficient, inexpensive method of construction," Durney says. "The whole key to this system is the low angle of the screw hole, which produces lower shift forces than traditional machines of this type."

Durney says both the machine and the process have been patented. The machine itself operates on material of any thickness from 1/2 inch to 2 inches. It has a 16- by 31-inch work surface with three fold-down wing tables. It operates on a combination of electric motors and air drive, and cycle time for each mortise is less than two seconds. The machine is priced at less than \$2,000.