Shaper/router

Woodworking shapers and routers are machines that cut various straight and irregularly shaped (contour) profiles such as tonguing and grooving, and decorative molding. Although there are slight differences in operation, both routers and shapers use one or more cutting heads mounted on a rotating, vertical spindle. Shaper spindles are normally mounted below the stock and router spindles are often mounted above the stock.

The primary difference in operation is how stock is fed into the cutter. Routers commonly cut either stationary or moving stock and shapers cut only moving stock. On manually-fed shapers, the operator feeds and manipulates the stock against the rotating cutter while keeping the stock flat on the table. Guides can be used for irregular cuts and fences are often used for straight line shaping.

Hazard

Amputations or severe lacerations can occur if the operator contacts the cutter head. Also, loose clothing or gloves can become entangled in the rotating cutter or spindle simply due to the operator's proximity to the cutting head.

Routers and shapers rotate at tremendous speeds — many operating in excess of 10,000 rpm. Any imbalance or vibration of the spindle and cutter presents a significant flying object hazard.

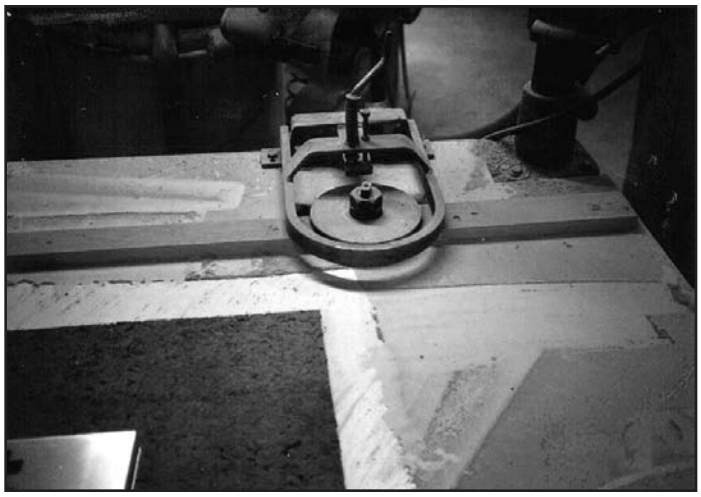
Hazardous kickbacks of the stock also can occur.

Exposed cutting head on shaper.

Solution

Ensure that the spindle is enclosed by the machine/work table or a guard. The table opening for shapers must provide support for the stock to within .25 inches of the largest diameter cutter (inserts must be provided for smaller diameter cutters).

All sections of the cutter must be safeguarded, except for the opening to allow stock. For straight-line shaping, a fence must be provided to limit the depth of the cut and enclose the non-working side of the cutter. The fence should contain as small an opening as possible for the cutter and extend on either side of the spindle. The fence or an additional guarding provision must also protect the operator from above the cutter by extending beyond the largest diameter cutting head.



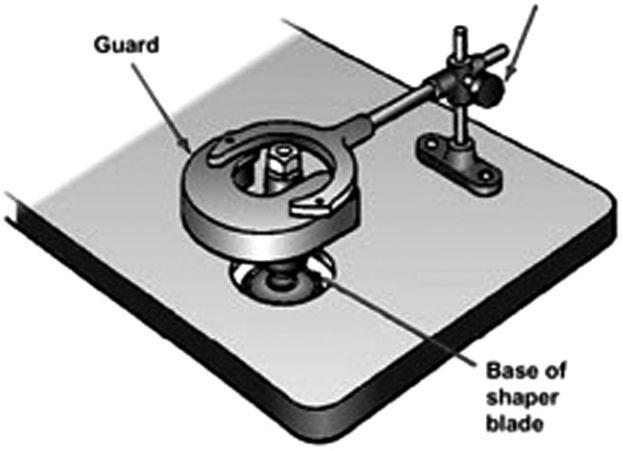
Fence and barrier-type guarding used for straight-line shaping.

For contour (free-hand) shaping, a "ring" guard or other type of adjustable guarding must be provided to protect the operator from the exposed cutter (see accompanying illustration). If properly set up, this guard may also hold down the work, minimizing kickback.

Use templates, jigs/fixtures, featherboards, or push blocks to distance the operator's hands from the point of operation and to aid when shaping smaller dimensioned stock. Avoid wearing loose-fitting clothing or gloves.

To minimize hazardous kickback, use extra care when shaping stock that contains cross grains or knots. Use a secure stop block where an interrupted cut is made. Do not back up the stock (check to see that the direction of rotation is as expected).

Ensure the cutting head is stable and does not vibrate excessively when operated at maximum recommended speeds.



Source: *Concepts and Techniques of Machine Safeguarding*, OSHA

References

- **General Industry**
  Oregon OSHA Division 2/Subdivision O 29 CFR 1910.213(m)(1)
- ANSI 01.1 *Woodworking Machinery — Safety Requirements*