Plane Talk for Better Lumber

Continuing Peter Koch’s discussion on better ways of planing lumber in the mill. A brief look at some important factors such as two-way thicknessing, rate of output, and economy.

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In the conventional cutterhead arrangement the pressure on the lumber passing through the planer is exerted downward—forcing the stock against the lower bed line first. The effect is as follows:

1. The top cylinder must remove the excess thickness, if any, to produce a finished face. The lower cylinder then takes a fixed cut from the back or lower side of the lumber regardless of whether the face has been surfaced or not.

2. If the stock is too thin to be surfaced on the face, it will be made still thinner by the cut from the lower cylinder causing unnecessary waste.

3. Because the upper cylinder cuts while the lumber is still rough on the back, it may produce a wavy surface on the face.

“Two-Way Thicknessing”

On the Two-way Thicknessing planers the bottom cylinder cuts first, and pressure is exerted upward against the top platen which is solidly locked in a position which reserves the thickness necessary for surfacing the face, face up, afterward. These planers operate as follows:

1. A varying, unmeasured cut, heavy only if stock is thicker than necessary, is taken on the bottom cylinder against a solid overplate: i.e., the lumber is measured and thicknessed, first from the back against a solid plate above. Thus, the surplus stock, if any, is taken from the heart, or low grade side of stock, having a face side.

This method of taking the most material from the back has another advantage due to the fact that all lumber, after it is run through a planer, will warp or cup to a certain degree toward the side from which the planer takes the heavy cut. As this is the case, instead of flooring being cupped toward the face side which spoils the matching, it is cupped toward the back and the matching remains perfect. As the machines never remove a heavy cut from the face side, no stock warps toward the face, but instead, all warpage is toward the back, leaving the edges turned away from the face and joints closed rather than open.

Again, if the stock is too thin to allow for planing fully both sides, only a light cut or no cut will be removed from the back, depending upon its varying thicknesses along the board, because it will be pressed upward—measured—against the upper bedplate by the upward pressure means and the bottom chip-breakers and held there until it passes the bottom cylinder.

Thus, the lumber will purposely be left rough, or partially rough, on the back, and not be made thinner without any good reason. Stock will be skip-spot-planed on back, only at such places in the board.

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Furthermore, the only thicknessing cut is made while the back is rough and the lumber is not traveling in a true line when the face is being planed. In order to finish the back of lumber, the bottom cylinder of the other planer must be set to take a certain predetermined thickness of cut—a measured fixed cut. Then, regardless of the thickness of the lumber itself, the bottom cylinder takes its measured fixed cut, making a thin board and destroying a vital portion of stock which should have been reserved for the face.

**Economy of Operation**

It is mere idle speculation for practical engineers to consider the ultimate surface quality and dimensional accuracy obtainable in the planing process unless the economic feasibility of such an operation is considered. There are many factors involved in the selection of adequate planing machines for economical operation, but a partial list of the desirable characteristics must include high utilization of material, high rate of output, versatility of set up, ease of maintenance, simplicity and safety of operation, and initial cost compatible with rate and quality of output.

**Utilization of Material**

To consider the first of these desirable qualities, utilization of material; there is no more lumber saving principle of planing wood than that discussed previously in this article. In long term tests this "Two-Way Thicknessing" process it has been proved that, compared to conventional planing methods, it is possible to saw lumber no less than three percent thinner than standard practice, and still maintain a quality and grade of output superior to the conventional machines. This 3 percent saving in stock is...
Versatility

As the refinement of machine design proceeds, the accent shifts from speed to versatility. Operators are interested in a machine’s capacity to run a multiplicity of patterns with a minimum of down-time. Notable among the comparatively recent developments along this line is the use of push button controlled motors to hoist the top rolls, cylinder, and profiler, and to traverse the outside head.

Quick pattern change has been further accelerated by the use of tapered spindles for the sideheads, which self-center a cutter-head that has been jointed in the grinding room prior to use. Perhaps the development of most importance to quick pattern change is the versatile profile yoke or cartridge unit. This profile yoke unit consists of an aluminum yoke which slides into the machined ways of the profiler. Mounted in this yoke are a pair of precision ball bearings in which the profile arbor runs. At one end of the arbor is a pin type coupling which couples this unit to the driving motor when it is slipped into place.

The advantage of this slip-in yoke system lies in the fact that a complicated, multi-knife, profile pattern can be set up, mounted on the arbor, ground, jointed, tested, and reground to the joint if necessary—all in the grinding room, well in advance of the pattern change. Thus when the time comes to change patterns, the old yoke is slipped out and the new one slipped into place in a matter of seconds. The time consuming and costly practice of setting up and jointing a head on a fixed profile arbor in the machine is eliminated.

Ease of Maintenance

Of considerable importance in the selection of any machine is the consideration of maintenance. In relatively recent years, individual motors have largely replaced belts, push buttons are replacing hand cranks, ball bearings continue to replace babbitt bearings, and breakdowns of expensive machinery have been minimized by sealed in splash lubrication of important moving parts, replacing unsealed grease lubrication. It is to be expected that central lubrication and pressure oiling systems will soon be in the picture.

Simplicity and Safety of Operation

A major current trend is toward simplicity and safety of operation. Machine designers are gradually thinning out the number of men necessary to the operation of a planing mill. A few highly trained operators and a grinding room specialist have, in modern operations, supplanted the hoard of semi-skilled and unskilled workers that surrounded the old time planer and matcher. While the planing mill is, and always has been, a place of high occupational hazard it need not continue to be so. Perhaps the design improvement longest overdue in this respect is the development of an effective method of sound proofing the high speed planer and matcher. It is hard
to imagine a factor more damaging to plant efficiency and individual mental efficiency than the all-pervading and ear shattering whine of a sixteen knife planer and matcher operating at high speed.

Coupled with this incredibly high noise level is the extreme temperature fluctuation in northern latitude mills necessitated by the customary open planer shed construction and the high rate of air exchange occasioned by the intakes to the blower system, which ordinarily are located at each planer head. More attention to proper lighting and some consideration of color conditioning would not be amiss in most modern mills. As the lumber industry becomes more stabilized it is to be hoped that mill engineers will concentrate more on the efficiency of the plant personnel as well as on the efficiency of the machines.

Having considered three phases of planing machine requirements, namely factors affecting quality of finish, dimensional accuracy, and economy of operation, one can see that there is much yet to be done in the long march toward higher quality lumber obtainable at lower cost. Machine selection is no longer a matter of obtaining a machine with the lowest initial cost but rather a problem of balancing tooling investment against quality and rate of output.

THE END