

Working centres for the primary and secondary transformation of solid wood

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ACIMALL (Italian woodworking machinery and tool association)

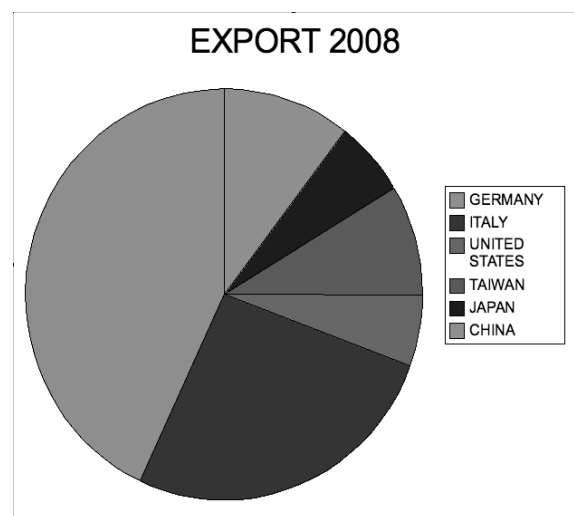
Allow me to introduce myself: my name is Attilio Griner and I have been invited here to share with you almost forty years of experience in primary and secondary wood processing.

With an acceleration that we are by now accustomed to, changes in this sector have also occurred with increasing speed and I have witnessed the birth and development of the Italian machinery industry.

At the end of the 1960s this was practically non-existent (the majority of machines in use were imported) but in the space of a few years, the national market was saturated and then became consolidated with an international export market. Today there are more than two hundred manufacturing companies and our only real competitor is Germany.

According to reliable esteem the world-wide turnover for woodworking machine is of 10,6 billions of euro of which half are produced by Italy and Germany.

Moreover Italy and Germany alone produce also two on three of all over the world woodworking machine exported (this are instead a reliable data coming from official statistics of import export).

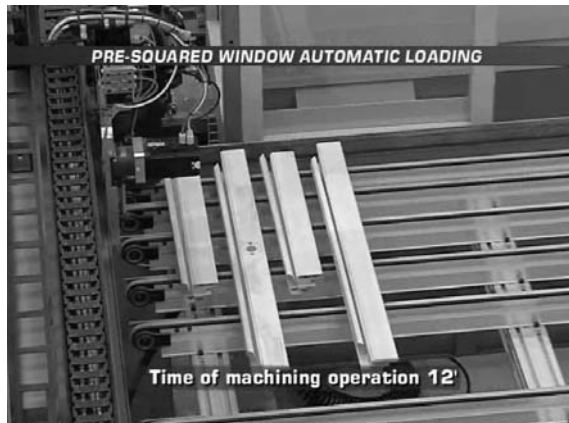


But changes happen quickly and new protagonists have burst onto the scene.

Industrialized wood processing originated in the United States at the beginning of the twentieth century; the manufacturing centre of gravity then shifted to the United Kingdom, France, and finally Germany and Italy as the earlier leading lights disappeared from the scene or took on minor roles. It should not come as a surprise that in the general trend towards the East, the next countries in line could be China and India.

We shall see.

However, it is not all about changes in key players: the game itself has changed.



Up until the end of the 1980s secondary processing was centred on the need to maintain and increase production of thousands of mass-produced and identical small pieces to meet post WW2 reconstruction demand, and then to support economic development in European countries and finally that in Eastern and Third World countries.

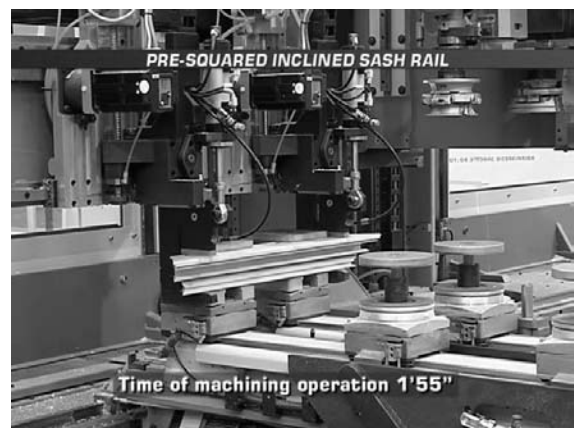
Craftsmen who had passed on centuries-old traditions were gradually transformed into machine or plant operators, progressively losing touch with know-how that now can never be regained.

Society changed as well: woodworking lost its appeal.

This is a well-known fact in Italy, Germany and France and is also the case across all of Europe, there is a shortage of enrolment in schools, training and research centres and the efforts undertaken to reverse this trend seem to have been to little avail.

At the end of the 1980s there was a change in market trends: mass production was no longer called for and there was increasing demand for small-scale lots, together with a wider and more varied product range.

From a privileged position as a specialist with the Italian Woodworking Machinery and Tool Manufacturers Association (ACIMALL) with daily contact with companies and meetings with foreign colleagues, I had inside experience of the effect of the combination of this demand and the extraordinary development in electronics over these years. As you may recall, although many of you may be too young to remember, the first PCs made their appearance in companies and in homes at the beginning of the 1980s and these years witnessed the first applications in the wood industry, particularly in vertical milling and point to point drilling.



I will briefly attempt to explain the reasons for the success of these applications with some examples; these are the same reasons I am convinced that within a few years CNC

machining centres will completely replace secondary processing machines for both solid wood and panels.

Once upon the time there was the vertical milling machine. Or better, there was what joiners called a router, which could machine the most different pieces. It had a nice worktable where you could lay semi-finished materials and, with a counter-template, the joiner could use the milling cutter, suspended above the table, to obtain any desired shape.

The milling cutter could be easily replaced in order to get a suitable profile.

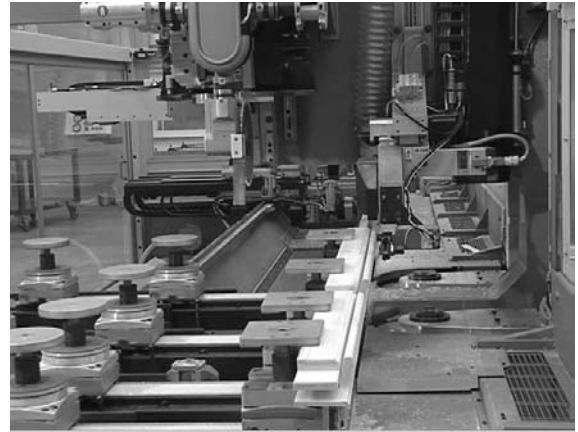
The worktable height could be adjusted and the rotation speed could be adapted to the dimensions of the tool by simply moving the belts on the pulleys.



It may seem a bit complicated, but a skilled joiner was able to produce a few different pieces every hour.

If there were many identical pieces to machine, it was enough to build a well defined template to clamp the raw material and, thanks to an

ingenious mechanism featuring guiding rollers and, possibly, a drive pin projecting from the worktable, the operations were automated.



And if you kept the template, you could repeat the same operation even after a long time.

You just needed to put away the template with all necessary information such as the cutter/s to use, speed settings, adjustable height, etc.

With this system, once you had set the machine, you could produce dozens of pieces per hour and repeat the operation later, if the adjustment was well done, if the cutters were the same and if re-sharpening operations were accurate and if... and if... Even after a long time, the finished pieces were reasonably similar to the first sample.

Of course, having dozens of templates - some of them also bulky - or even hundreds for subcontractors could be a problem, also because warehouses used a LIFO approach (last in first out, as defined in most management manuals).

The templates used recently were normally the most accessible ones, but if you needed older

templates, you only had to move some materials and that's it.

However, it was just like shuffling cards and having to find immediately the deuce of spades.

Let me say, joiners were absolutely good at working but they were not very good as to tidiness and order... Not to mention technical sheets and logbooks.



But they could remember every single piece that was in their joinery, so, as long as the master joiner was not ill, have you ever heard of a joiner or a craftsman being ill? , everything went reasonably smooth.

The multi-head and multi-spindle drilling machine is a wonderful big machine and a jewel of mechanical engineering which can make hundreds of holes simultaneously - on the top, sides, back and front of a panel in any position (almost any, because there has to be a minimum distance of 32 mm between some holes) in few seconds.

With 3600 seconds in an hour, with an effective and reliable loading system, you could produce, say, 360 identical panels in one hour.

Well, the problem was the word identical because, if the good old times of mass production did not come back, who would need hundreds of identical panels? However, with the same machine you could also produce different kinds of panels, you just needed to position the heads properly, remove the drilling bits and replace them with the required ones.

This had to be done manually and following the drawing of the piece, but at least the drills had a quick clamping system and the heads were provided with position indicators.

You just had to be careful and the preparation still required dozens of minutes, and maybe you had to produce only a few dozens of panels with that drilling pattern.



There was a solution: provided it was possible to plan production over reasonably long times, at least in terms of months, so as to have consistent batches, and considerable room was available for panels waiting to be re-processed, everything

could work and the machines were used at their best.

But the same was not true for the costs due to the keep semi-finished materials waiting in stock, the occupation of spaces and the staff that had to handle materials. And finally, the commercial offer was very rigid.



There are production lines featuring a nice combination of machines in sequence: moulding machine, tenoners, profiling and external profiling machines for doors and windows, squaring-edgebanding and drilling machines for panels. High productivity, flexible and huge lines.

Yes, but how much flexible? What If I wanted to produce one window? And if I wanted to make one cabinet? And if I wanted to make one kitchen?

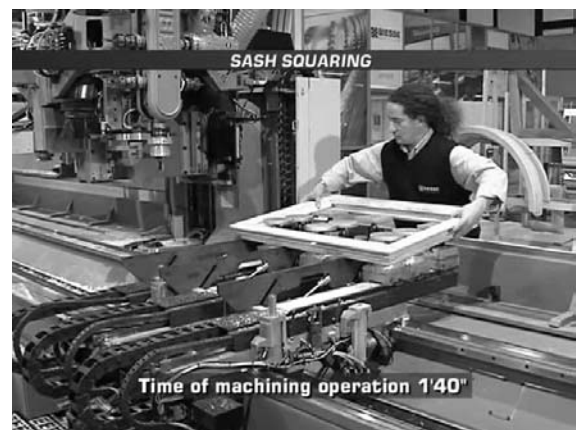
Sorry, I was taken away by reminiscence, but excluding the router , which has almost faded away (I think that there is in Italy just one manufacturer, but for whom and for where?), the

other machines (I mentioned just a few examples, but there were many more) are produced still today.

However, they are no longer the stars of exhibitions and marketplaces, where working centers are dominating.

This applies not only to any piece of solid wood for furniture, chairs, doors and windows, construction elements and panels with any cutting, profiling, drilling pattern and maybe edgebanding and hardware inserting, but also , starting from a large panel and using the nesting technique , to all the elements of a piece of furniture made in one single cycle.

The templates, counter-templates and dusty warehouses of semi-finished products have been cast into oblivion: in the data storage devices of working centers , maybe remote , there are all machining programs that can be retrieved in any moment to produce a specific piece exactly as you need it and when you need it.



Just more than twenty years have passed since the introduction of electronics in our industry, with the first NC milling machines and point-to-point machines, but fewer years will pass before we can say again once upon a time ... and make a much longer list.

During the course of this presentation, you have seen on the screen behind me one of the most advanced machining centres in existence for all mechanical processes for windows, showing some of the most important operations achievable (not all of them, only some key examples) and relative execution times.

Productivity is clearly not the same as that for a traditional production line (automated in its turn by powerful electronic control systems) which it can run alongside, but it can realistically produce to a strict deadline, one after the other, the windows of various shapes and sizes that today constitute a considerable percentage of the production mix for a company in this sector.

This is just an example as similar machinery centres exist for structural elements for wooden constructions,



hardwood and panel furniture and for any element in wood or derivatives that you could imagine.



You will find further information on our site and in the magazine we edit.

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Thank you for your time and I wish you all the best in your work for this conference.