



## CD-ROM as a sample book

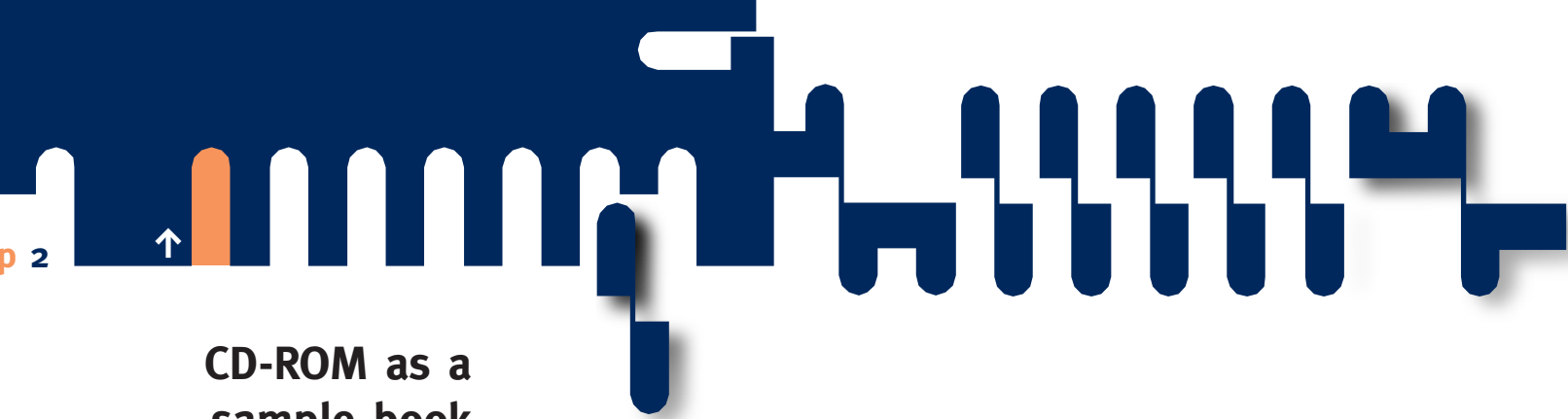
from: POe Sonderheft 9/97

### **New tools could bring the craft trade out of the defensive**

by Jochen Gros

The decentralized one-off or small-series production is one of the essential goals of ecological politics. The craft trade then usually gets into the field of vision of the ecologists. How can one develop this way of production more effectively than it has been done? How can one go beyond the mere attempt of reanimating the classical craft trade? Modern computer-technology and CNC-machines present new directions.

The role of the craft trade defines itself today above all by contrasting itself to the industry. At the same time the local production of customized consumer goods has been pushed back extensively. It is true that there had always been resistant movements in the craftsman's or neo-craftsman's trade, but none could stand up against industrial productivity. Over one hundred years ago William Morris led the probably most well-known battle of retreat for the classical craftsman's production. In the course of the Arts & Crafts Movement, which aesthetically favored a shift from pomp to unpretentious forms, he phrased many good arguments: "Beauty of the Products", "Joy at one's Work", "Harmony with Nature" and so on. Only the economic reality stood against it. The decline of the craft trade was not to be stopped in this way.



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In the 70's the alternative craft trade nevertheless brought two new components into play, ecology and "middle technology". But the ecological conscience as well proved a buying motive only for some time in a limited setting and the "middle technology" concept was formulated in theory. Nevertheless, its realization got stuck at the very beginning. The goal was a "new trade" that comes to an arrangement with parts of the industrial production, using industrially created materials and semi-finished products, and copying up to certain degree an industrial recipe for success: the construction of jigs and fixtures. Jigs and fixtures and special product templates were used in order to make at least small series payable again. However, with the end of the alternative movement, the "middle technology" concept was given up.

The so-called "new design" of the 80's developed in the direction of art, and was therefore forced to accept a manual production. The designs were so shrill, skew and individual, that mass production was hardly worthwhile. Furniture, to give an example, was welded together out of steel tubes just like at the locksmith's and sold without any coat of lacquer. It was supposed to look more cool and bring the prices down. In spite of that, the artistically inspired furniture craft still proved too expensive and in the end did not even correspond with the Zeitgeist any more.



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### New Tools

This kind of experience causes skepticism. Therefore, new formulas are needed upon which to base new hopes for the craft trade. Political standards are conceivable, but so are “new tools“. If we consider only the second possibility, then the question is: What opportunities do new technologies open up for the craft trade or for a renewed decentralization of our production and life style? Will the computer-aided technology be the first step towards a more lasting way of production?

The new digital or computer-aided production certainly starts to move the old balance or rather the current imbalance of craft trade and industry. In the interplay of forces between various forms of production the cards are being shuffled again. And it looks like the craft trade gets a special joker, qualitatively new tools.

However, to play this card it is essential to have a closer look at the characteristics of those new production tools. Where actually lies the central difference between the craftsman's, the industrial and the computer-controlled production?



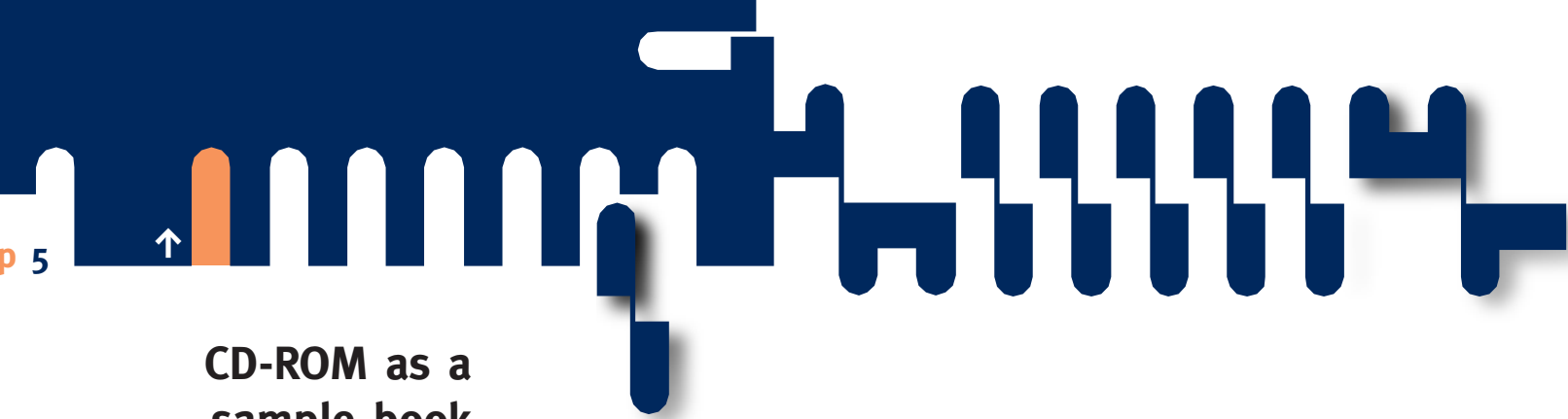
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For years now a company called “Dick“ has increased its turnover with the tools of Japanese joiners and carpenters. Today those tools look almost the way they did 1000 years ago. Other tools like the circular saw and the planer have been electrified and optimized, but those are only gradual improvements. When we talk of the production technology in the craft now as well as before, we mean the decentralized one-off production with a universal tool.

The productive advantages of the industry at any rate are on another level. They are not based upon superior tools, but on the construction with jigs and fixtures. For every product a special utensil is built, i.e. contour templates, raises, bending devices and so on. Assembly lines constitute only the logical sequence of the various devices. Since Henry Ford they are the embodiment of industrial special tools and naturally make sense only with big series.

The main characteristic of computer controlled tools, is to combine in a completely new way the basic principles of craft trade and industry. While the hardware (for example CNC-router, water torch and raise) consists of universal devices again - and can therefore be considered as typical for the craft - the software offers the same advantage as industrial templates and devices. Surely they are not mechanically built and added to form assembly lines, but transformed into software. When we put in a disc with special product data - in a way an electronic device or digital template - the hardware and software jointly work like an industrial special device, only to a high degree independent of lot size.



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No particular term has yet been named for this new production pattern. Still it is already considered definitely to be “post-industrial” and “neo-craft” **(1)**. It almost looks like “overcoming industrial production in the fastest possible way”, an appeal already made by the ecologist Herbert Gruhl in 1975, and it comes up to us stealthily today in the form of a technological revolution.

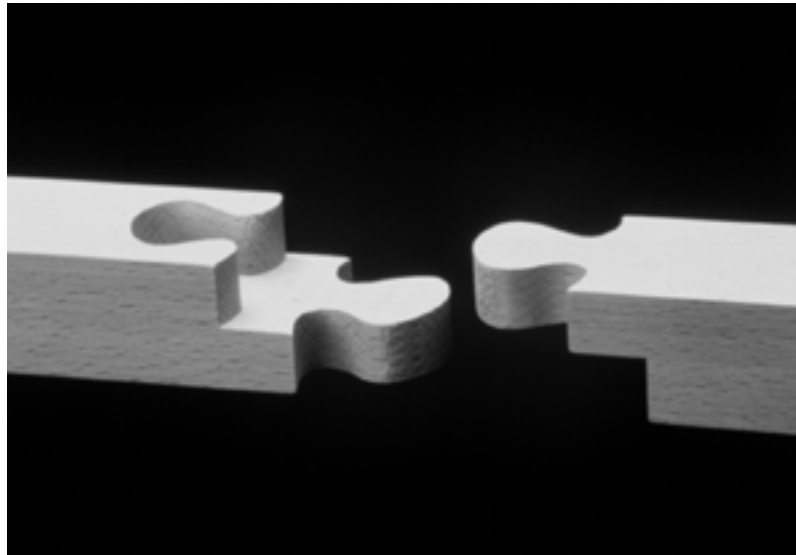
## Equal Opportunities for Craft Trade and Industry

Let us look at the development taking wood working as an example. At first the new computer-controlled tools are only used within the old structures and nearly only to rationalize existing products. By now the furniture industry produces 60-70% of its products with the new technology, and about 15% of the joiner's and cabinet maker's workshops in Germany have one computer controlled router (installation cost of at least DM 130.000, it costs considerably more to newly furnish a joiner's workshop with sawing machines and wide belt sanders) at their disposal. One needs to consciously remind oneself, that in a joiner's and cabinet maker's workshop there are now exactly the same computer-controlled machine tools as in a factory.



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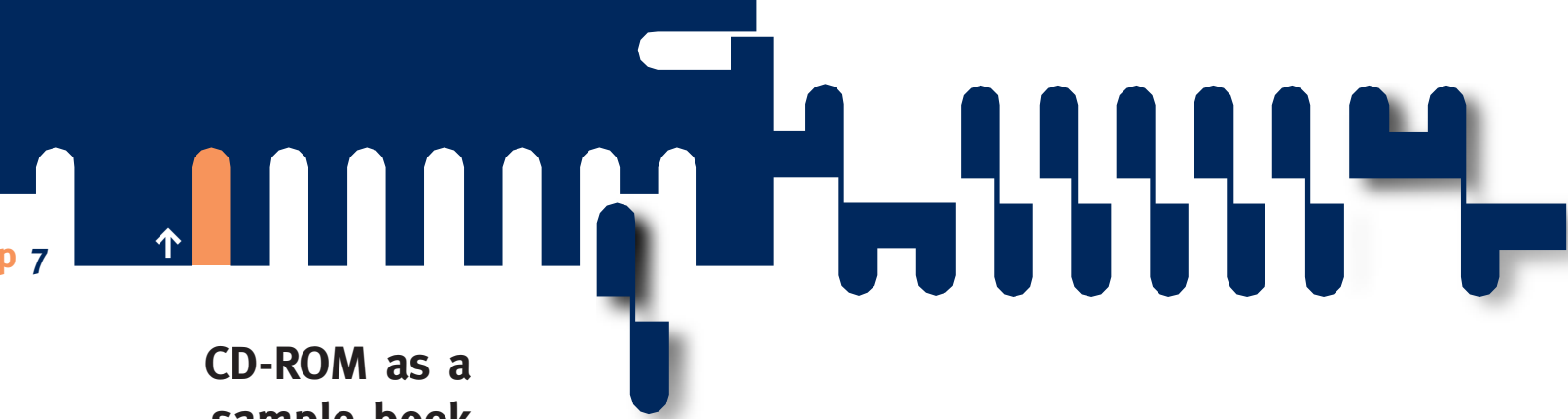
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Double Jigsaw Joint

The new craft trade gains equal opportunities at least concerning the production technology, something the classical craft trade never had compared with the industry. To be precise, structural changes announce themselves, changes which will lead to a convergence of craft trade and industry. Corresponding cues are for example “electronic craft trade” or “techno-factory”. (2)

As a matter of fact, the new production technology constitutes only a necessary but insufficient condition for the development and reformation of the craftsman’s production. It is only the basis for a possible structural change. Therefore, the new style of production surely also requires a new product style and finally a lifestyle that responds to both.



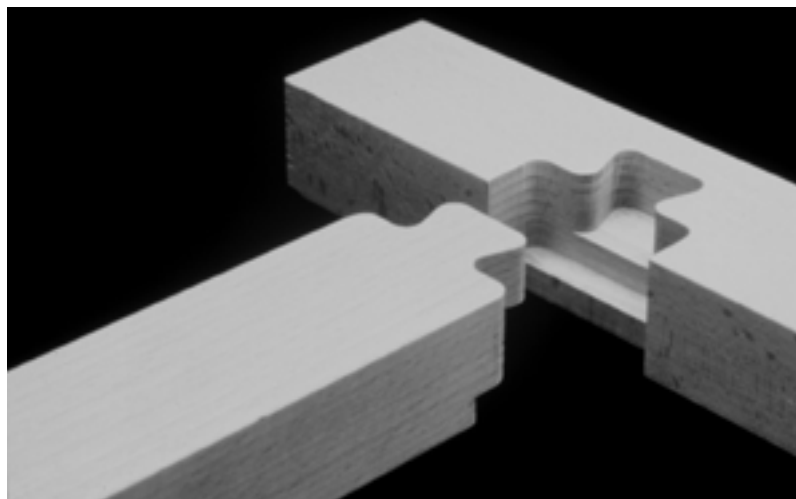
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The interaction between production style and product style are clear to the designer to start with. This central design problem is maybe best shown in a review of the history of design. Let us simply take the example of the Thonet chairs. At the beginning of the industrialization companies tried to mass-produce Biedermeier tables, rustic cupboards and flowery ornaments with special devices.

But, as it is well known, the industrialization of the furniture industry only started to really get going after Michael Thonet had developed a chair which broke off radically from the craftsman's techniques and made deliberate use of the industrial construction of jigs and fixtures. Since then this chair design is not only regarded as the prototype for production-compatible industrial design, but also as a precedent that shows that new forms of production demand new product forms and vice versa.

Shouldered Dovetail Halving





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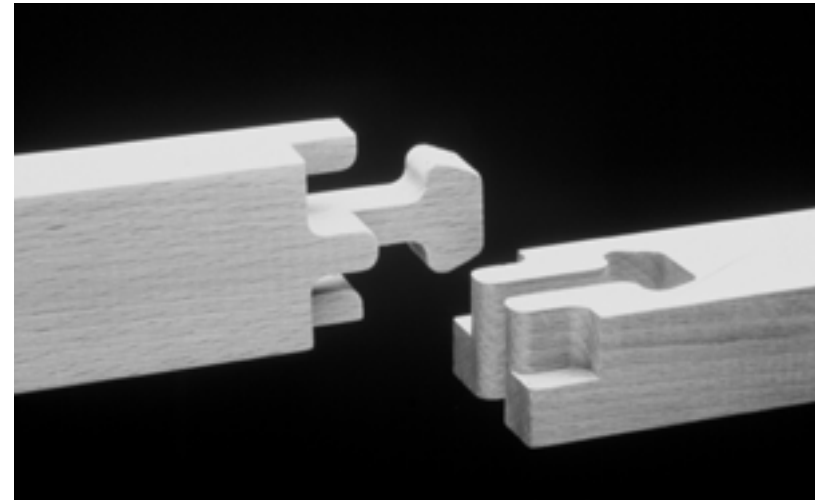
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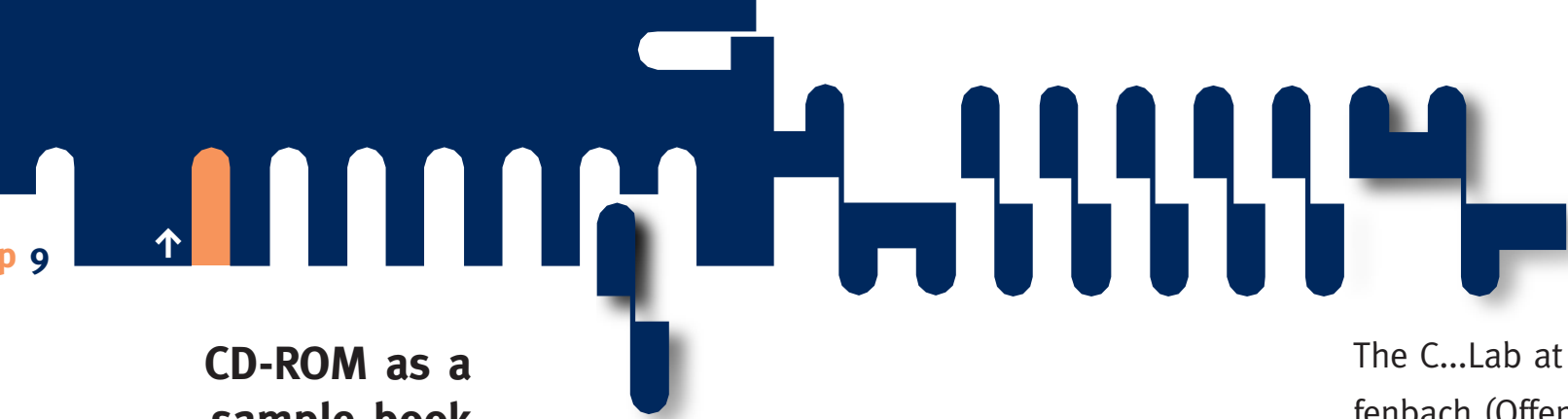
Gooseneck Mortise and Tenon

Joint with Stub Tenons

From the view-point of production-compatible design it becomes obvious why neither the classical craftsman's products nor the classics of industrial design are suitable for the computer controlled technology. Thonet chairs for example could never be and still can not be produced with decentralized one-off production. The project of local customized furniture production would have to fail, if we only tried to take our current product mix over to computer-controlled production. In the same way that industrial production could only develop with production-compatible industrial design, the computer-controlled production also needs its production-compatible products.







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### What is CNC-technology capable of?

The classic Japanese wood joints are for several reasons a suitable touchstone for the thesis that the computer-controlled machines are a new tool. These highly developed joining elements have been manufactured in nearly the same form and with the same tools for a thousand years. The entire industrial progress could not produce a better tool. Until today these joints cannot be industrially produced. Therefore, if we succeed to produce such complex wood joints in payable one-off production with CNC-technology, there should be basically no problem with most other joints.

The C...Lab at the Hochschule für Gestaltung in Offenbach (Offenbach Design School) was founded in 1994 and currently tries to develop programs for the practical use of CNC-technology.

The goal is a CD-ROM which allows for example to input board measurements whereupon it automatically calculates the corresponding routing program. (3)

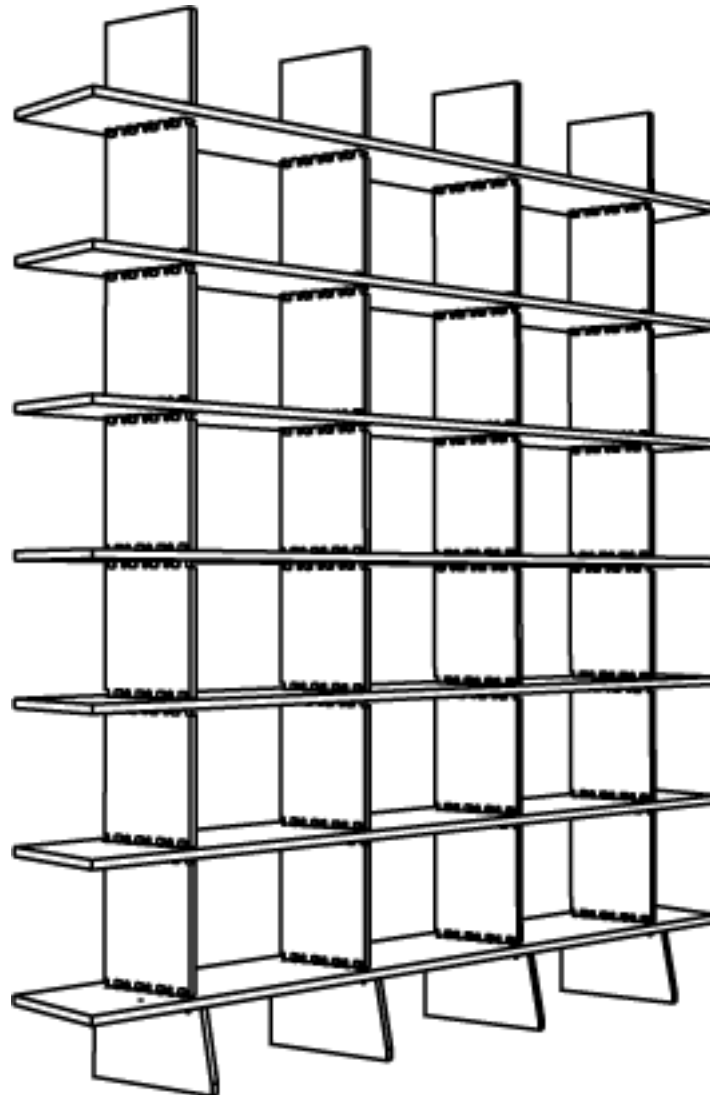
However, the products must be exclusively produced with CNC-technology. Only then can the advantages of the new tool be fully used. If a furniture still contains industrial parts, i.e. a serially produced injection mold piece, then changes in the measurements become difficult, if not impossible. The decentralized production does not make sense. Embracing 100% CNC-production is decisive for the structural change. We can not tell yet though which products can actually be designed under these conditions and whether the customer gets used to their form.

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Virtual products out  
of the computer:

Tenon-Shelf System. The construction is based on tenons joints that penetrate each other. The shelf is stable even without a back due to an inclined track of holes in the floor shelves.



A joint project of the C...Lab, the Technology Center for the Wood Manufacturing Industry in Lemgo and the North Rhine/Westphalia Wood and Synthetic Materials Professional Association has been started to explore this possibility. To start with ten prototypes of tables, stools, shelves and beds are supposed to be developed.

The Italian furniture brand “Op Top” has already gone further. This company has developed a franchising model for the decentralized furniture production based on its own design catalogue. It consists of a “showroom” in the city center and a production site on the outskirts equipped with CNC-controlled machines. The customer who orders a customized piece of furniture in the showroom will get it within 72 hours - allegedly 20% cheaper than comparable industrial furniture. This seems credible even when the higher costs of customized one-off production are taken into account.

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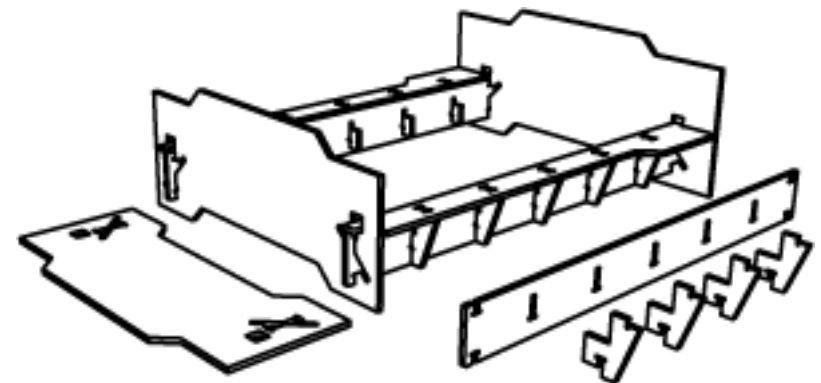
The Rib-Bed. Trying to develop a straight slot together system was in the foreground.

The retail price of industrial furniture, caused by storage costs, not salable end-of-line items, advertising, transport and trade margins, is generally about four times as much as the production costs.

The customized craft trade can therefore produce more expensively and sell more cheaply and still have lower retail prices. Now that the “Op Top” model has proved itself in Milan, it is supposed to be realized in 50 Italian cities and the exported all across Europe. If you want, an industrial mass production of decentralized “craftsman’s workshops” and furniture stores.

But the example “Op Top” also raises questions: Why are new production centers for the decentralized furniture production necessary, if they are only equipped with the same tools as the joinery around the corner?

And why a special showroom when there are enough furniture stores next door who will soon get into the same difficulties travel agents and book shops are in. What is left is the biggest advantage of “Op Top”: Their own design collection. No individual joiner can afford this, not even when he cooperates with a furniture store.





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For design studios, however, highly interesting possibilities are developing. Supposing there are already a sufficient number of specialists who can develop CNC-compatible products and offer corresponding production programs in the Internet or on sample-CDs. Could not then any alliance of cabinet maker and furniture store put together their own design collection from an “electronic sample book”? Would not the craft trade even have an advantage due to its historically grown and flexible structure?

## New Prospects

While the new tools open up a realistic chance to the craft trade of reviving the local customized furniture production, the furniture industry will also try to conquer this market. The difference will then probably only be comparable to McDonald's and a restaurant.

After the first concrete steps, other scenarios appear:

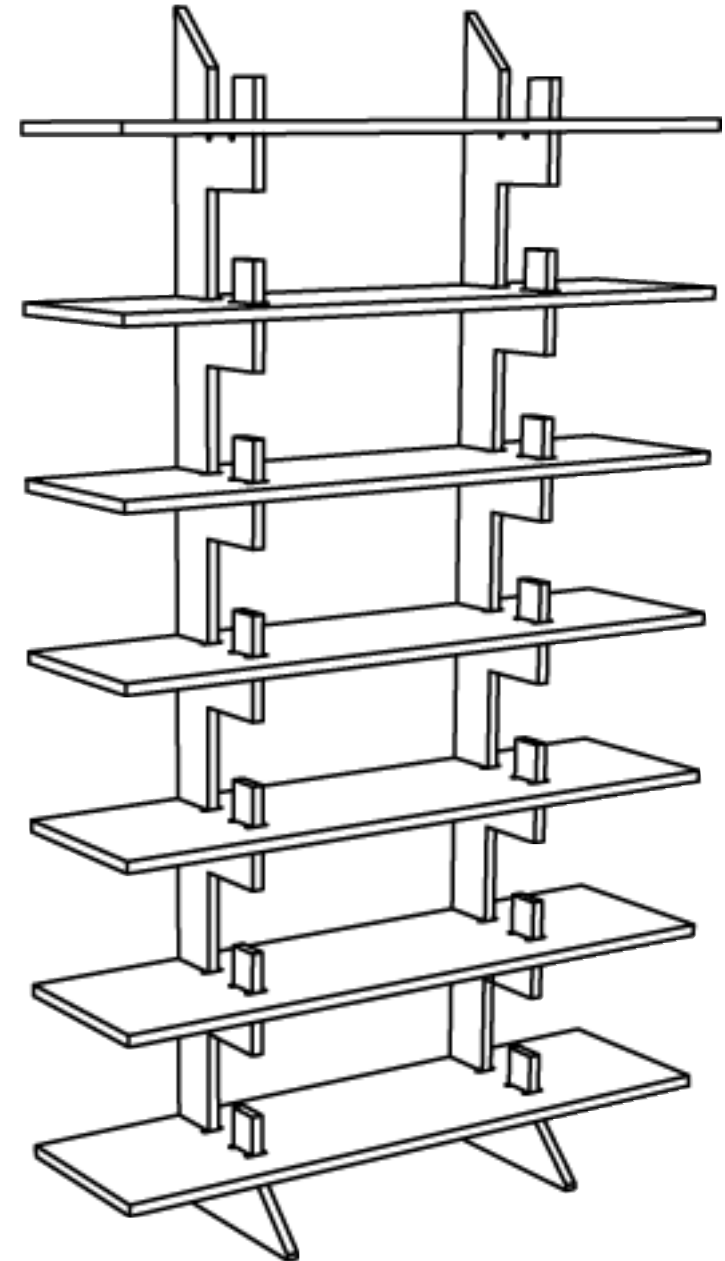
- The more clearly the computer-controlled universal tools are present, the more the structure of the crafts according to material will lose its foundation. As wood, metal and stone can be worked in a similar fashion with the CNC-technology, there will probably develop material-overlapping “techno-factories” due to the new technologies.

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Greek Key Pattern Shelf: Both shelf sides are cut in one go.

- Sooner or later the awareness will develop, that the new tools not only make the one-off payable, but are also perfectly capable of producing individual engravings, intarsia, reliefs and so on. This prospect is called “new arts and crafts“. Then it would not be accidental, that a key term will become fashionable again during the transition from the craftsman’s form to industrial design in the context of the new tools, the ornament.
- While industrially produced parts would look like alien elements in the computer-controlled production, classic arts and crafts could be combined with it without problems. But only “partly handcrafted“ due to costs.





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- In the same way that the furniture production turns individual and decentralized, it will be possible in the end to produce iron balcony gratings or garden gates with a computer-controlled laser beam, inlay work in stone with the water torch, parts of the facade with the CNC-router and so forth. Beyond the furniture trade the view onto a “new construction trade” opens up.

Finally those prospects cannot and must not hide a basic ambivalence. There is satisfaction, as the supporters of the craftsman's production style and its ecological advantages can not be put down so easily with by pointing out their obsolete technology and lack of competitiveness. But at the same time there is the nostalgic feeling, that many of its traditional qualities will get lost in the perspective of a new craft trade.

The only comfort then is that those traditional qualities are already very rare today in the existing craft trade and that, after all, the prospect of new qualities, even when mourning for the old ones, is not to be despised.

### Notes

- 1 William H. Davidow and Michael S. Mallone: The Virtual Corporation - Structuring and Revitalization the Corporation for the 21st Century, Harper Collins, New York 1992
- 2 Jochen Gros: Virtuelle Alternativkultur (Virtual alternative culture), in: Welche Dinge braucht der Mensch (What things does man need), editor Dagmar Steffen, Anabas-Verlag, Gießen 1995
- 3 Friedrich Sulzer: It's not a trick - Digitale Holzverbindungen (digital wood joints) in, dds - der deutsche schreiner und tischler, 9/96

