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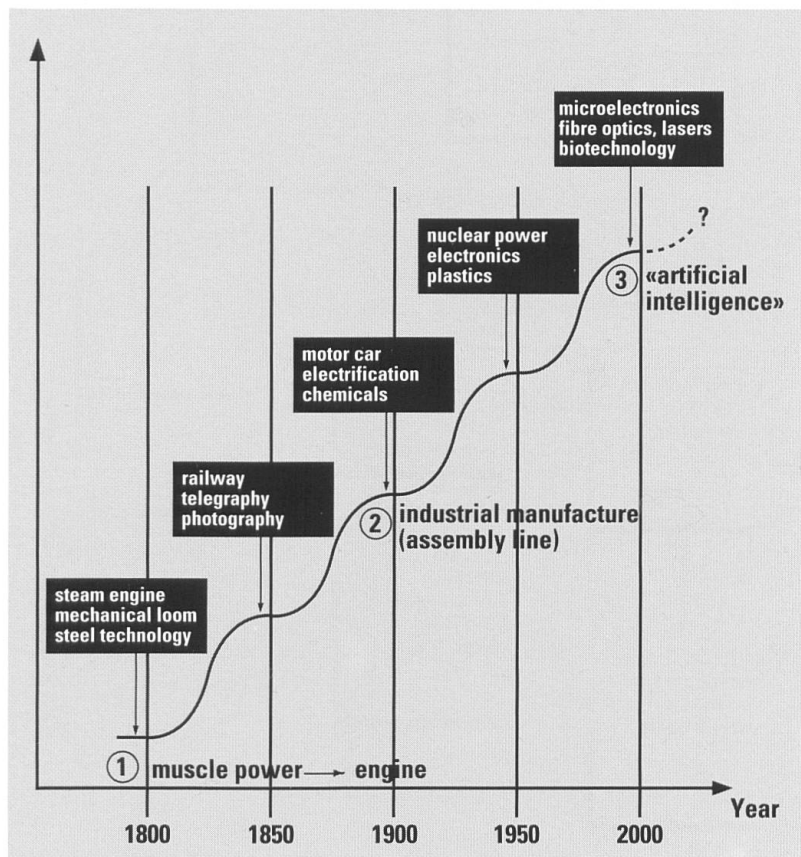
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# Introduction

## Technological change

The 200-year history of the Rieter company is characterized by a continuous process of change. These changes have affected people and their environment, office and manufacturing premises, jobs and the tools used in them, and social and welfare facilities. Over generations of personnel, the jobs in the machine shops initially using simple, manual tools developed into systems with computer-controlled machining centres. In the offices, development progressed from the high desk, through the carbon copy system and the slide rule, to semi-automatic typewriters, computer terminals or PCs at the workplace, modern copying systems and the databases of the up-to-date office. The future may well

*The stages of economic growth (Kondratieff)*



turn out to be the paperless office.

Rieter research personnel initially performed their duties as skilfully inventive craftsmen who took pride in their original development premises, the «cylinder house» on the banks of the Töss. Nowadays development work is carried out in the state-of-the-art research centre at Niedertöss. Scientific cooperation with universities is sought for important projects.

Well-balanced social and welfare facilities covering health care and provision for old age also give sensitive research personnel the security they need in order to concentrate all their efforts on the company's interests.

The hypotheses proposed by the Russian physicist Kondratieff suggest that we are currently in the microelectronics phase, which is forging on in the direction of artificial intelligence with fibre optics, lasers and biotechnology. These will probably lead a new generation of technology to new developments.

## Rieter engineering in general

Rieter's designers in the 19th century viewed engineering primarily as applied natural science. The diversity of Rieter's products, which included transmissions, water turbines, machine tools, electrical installations and electric tramways, bridges and rifles in addition to textile machinery manufacture, is described in the first volume of this bicentennial publication. The variety of sectors bears witness to an almost unlimited degree of enterprise. They demonstrated the potential of designers willing to take risks in the

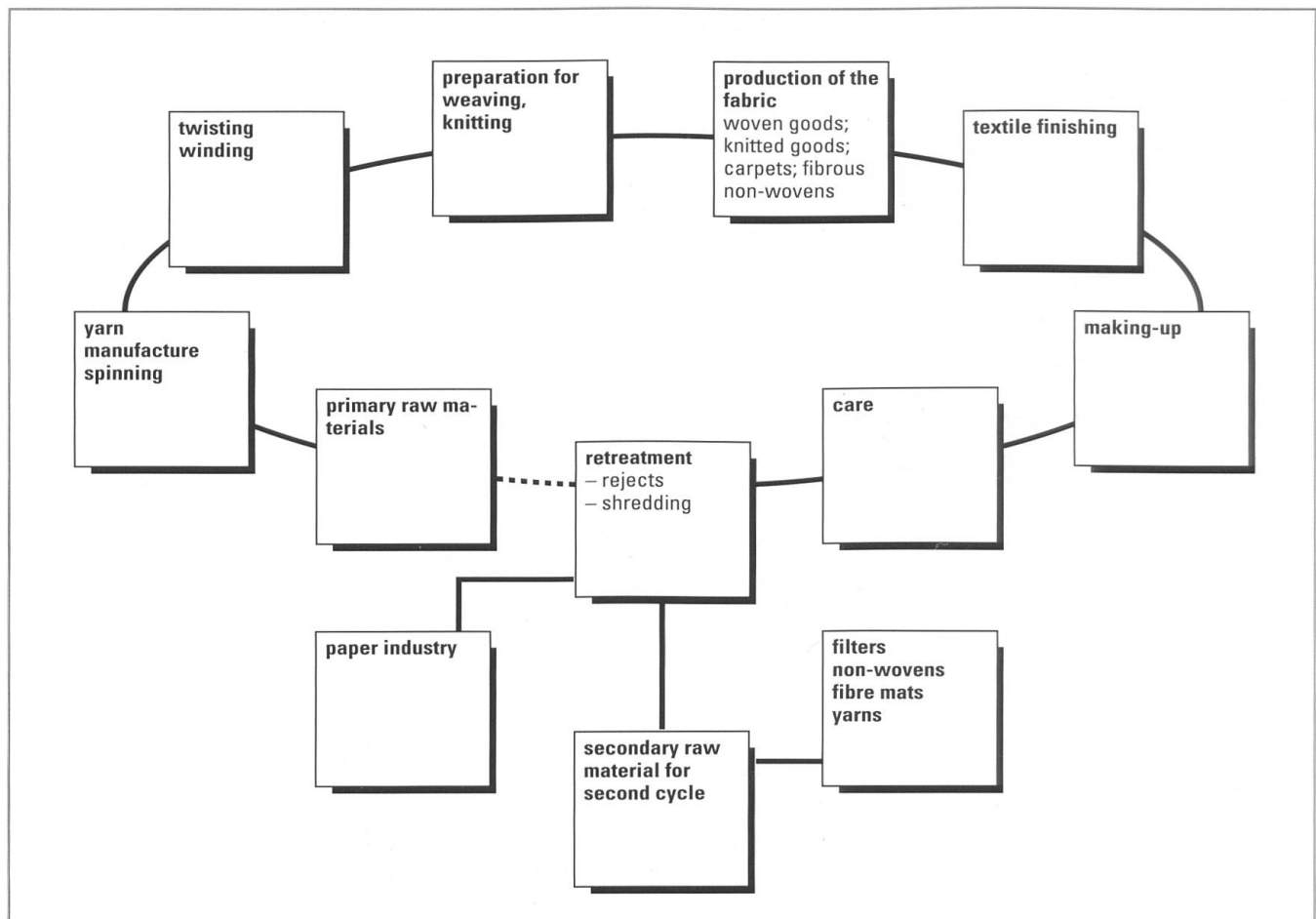
early days of specialist engineering. If these non-textile products are compared with the present day, the diversification efforts are most impressive. However, as engineering has become increasingly sophisticated, modern articles have developed into leading products whose manufacturing processes cannot be regarded as merely secondary. The time and cost involved and the effort invested in selling the products could not have been justified on this basis. Rieter Sympatec's air separation installations, Mägerle's laminate tube machines and experience at Unikeller can be cited as examples of these aspects.

### Textile technology as a system

When Rieter was founded, textile technology was already an art and craft several thousand years old. The relevant spirit of inventiveness is to be found, for example, around the year 1100 in ancient Chinese literature, in

which a silk reel is described. Special reference was made around 1600 to the guild of hose knitters for male outerwear. Basic developments to the mule - the first mechanical, multi-spindle spinning machine - were recorded in 1790. The technology outlined here assumed an increasingly rapid pace with inventive ideas during the period which followed. The development steps followed each other in rapid succession. It is therefore appropriate to take a look at the overall textile process, both in its manufacturing stages and in its total life cycle. What began with primary raw materials experiences total recycling into a new existence after being manufactured and used until it is worn out. However, disturbing factors such as global warming also play a part in these considerations. The increase in temperature of some 1.5 degrees Celsius in the past hundred years has created conditions conducive to the use of

*The overall textile process – a life cycle*



lighter woven and knitted fabrics. These require finer fibres to produce finer yarns in ideal quality.

### **Rieter spinning technology**

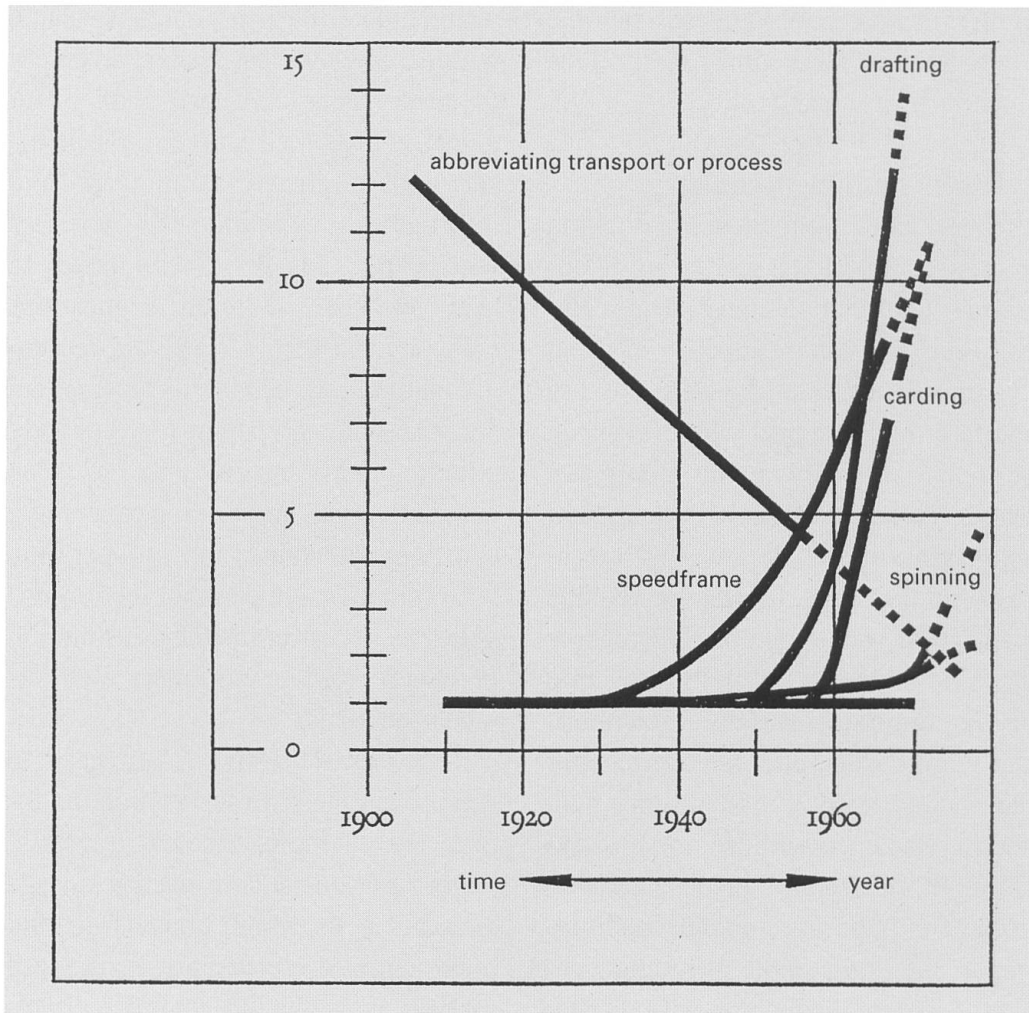
Rieter has sought a leading position in this sector since it started to manufacture textile machinery. The company seeks to advise its customers on the most appropriate systems to use and to provide support wherever it can be applied profitably in the system as a whole. This task starts with the use of appropriate raw materials, and nowadays continues as far as the reliable disposal of waste materials. It regards machine manufacture as the selection of the optimum structural elements and maintenance and operating materials which can be advocated with good conscience with a view to recycling. While technological leadership in the fields of short-staple, medium-staple and long-staple spinning processes is a realistic proposition, filament spinning systems are generally subject to different rules. The top rank of major chemical groups in the sector conducted their own technological research and contracted out exacting machine manufacturing assignments to Rieter. This philosophy demands high performance from Rieter and imposes requirements of discretion. There is therefore a sound basis for the company's efforts to become a technological leader in the filament sector, too.

### **Future developments with coordinated project groups**

The demands imposed by textile high technology are very exacting. The highest standards achieved by aerospace engineering are far from adequate for continuous, three-shift textile operations, and the idea of building new textile machines from tried and tested automobile components

would make these products unusable within a few months. The achievement of peak technical performance requires coordinated work by mechanical and electronics engineers and information technologists, together with a high degree of willingness to take into consideration suggestions made by marketing staff, the recommendations of production personnel and the needs of patent lawyers. Full attention must be given to the basic and further training of all partners in a coordinated team, and cooperation with scientific educational institutions is just as necessary as the consultation of experienced practitioners and service specialists.

There are still significant gaps in general engineering's route into the future. For example, wireless transmission of power, random energy storage and fuel cells which convert air and hydrogen into electric power, are still utopian concepts. In textile technology, for example, textile crimping and easy-to-wear synthetic filaments are still far from perfect. The heat and moisture exchange of synthetic filaments still does not bear any comparison with the behaviour of yarns such as wool. Wide areas of endeavour therefore remain open for research and development. The prerequisites for future success are within reach thanks to CAD technology, manufacturing using CIM/CNC, and information technology aids in virtually all areas of activity. At the same time the solution to the problem has to be sought at ever higher speeds. The physical properties of the raw material used, the efficiency of the process modules and the service requirements impose technical and financial limits in this context.



*Multiple increase in productivity in the spinning mill*