



## TAILORING TODAY AND IN THE PAST

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**Abstract:** *The essay contains a detailed outlook on the changes and the development of the measuring methods and the working methods in the cutting room.*

*The first step of producing garments is taking body measurements, which has changed a lot from using the measuring cords through the measuring tape to the modern body scenners.*

*Fitting together the simple, geometrical shapes of garment parts needed no special skills. Later, the cutting of more complicated parts needed trained and skilled masters. It took a long time that tailor-made cutting had been taken over by mass production, supported by computer-based cutting systems. Today manufacturers that are specialized in different product groups can select from the most modern and suitable solutions.*

**Keywords:** *take (body) measurements, bodyscanner, dresscutting, CAD-CAM system.*

### 1 TAKING BODY MEASUREMENTS

In the early times fitting animal leathers and then various fabrics onto the human body did not require taking measurements. Later, however, taking body measurements became the basis of making tailored garments. The methods of this operation changed a lot throughout the centuries from applying manual methods to today's computer supported, automated systems.

#### 1.1 Taking body measurements in the past

Ancient body measurement taking methods did not use measurement units to record measures. For the tailoring of garments, headware and footwear the measurements of the customer were taken directly, in real size. These measurements were not converted to any unit of length (eg. inch, sing, cm etc.). Tailors used cords or strings to take measurements of the body by tying a knot after each measure. The order of taking measurements was different for different types of garments. They used these measures to draw the cutting design which was originally drawn directly on the fabric. [1]

Ethnographical records show that even in the 19<sup>th</sup> century there were two typical ways of taking measurements of the human body: with a paper tape or with a cord. [2] According to Terézia Horváth's collection from Kapuvár: "Bootmakers and men's tailors used to work with paper tapes. In case of boots they needed about half a meter long and three fingers wide paper tapes which they folded into two to gain a straight edge. One end was left uneven and the other end was cut off. This end became the start of the tape and they calculated every measurement from here." (Figure 1.)

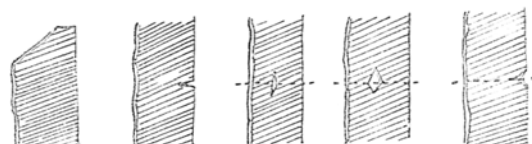
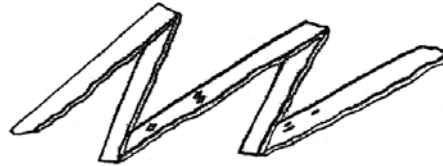


Figure 1. Elements of paper measures



A similar method was used for making garments. “Different measures were marked with different signs. (Figure 2.) When cutting the fabrics they did not have to consider proportions because every measure had a particular sign related to it.”



*Figure 2. The complete measure*

They did not note on the tape which garment it was used for because they knew it from the location and number of signs on a tape. They only noted the name of the customer on the tape and attached it to the fabric provided by the customer. No paper patterns were used because they transferred the measures from the paper tape directly onto the fabric. The shapes of various parts of a garment were drawn by hand with a piece of chalk or soap.” [2]

## 1.2 Taking measurements with a measuring tape

Before the single metric system various linear measurement units were in use (eg. inch, foot, ell). The standard unit of measuring textiles is called ell (one Hungarian ell is 62,2 cm) The metric system was introduced in Hungary in 1874. [3]

It was a French master tailor named Barde who first used a measuring tape to take measures and to make a pattern design. [1] He used a range of tools to take precise measures of the human figure. (Figure 3.)



*Figure 3. Barde's back measuring tool from 1834*

Master tailor Salamon Marmorstein presents measurement taking with a centimeter tape in his book titled A Schoolbook on the Trade of Cloth Tailoring but he measures the chest with a paper tape. He takes half of the chest measure and divides it into 48 equal parts. [4] He marks these equal parts with small cuts and numbers each of them. He applies this method in his book for various body figures. (Figure 4.)

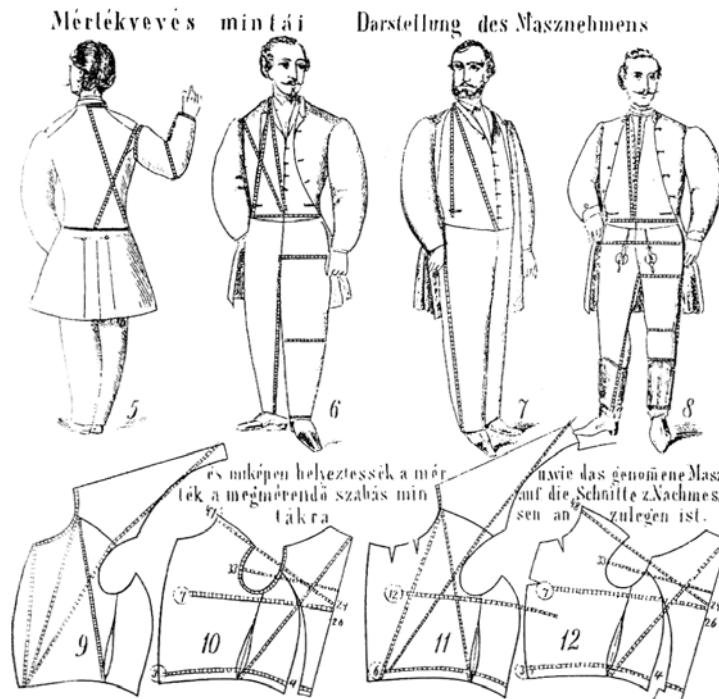


Figure 4. Figure adapted from Marmorstein's *A Schoolbook on the Trade of Cloth Tailoring*

It is a complicated task to record the very diverse measures and scales of a human body which has a unique shape. Professionals do this exercise with special tools like an anthropometer and a measuring tape. This job requires a great deal of expertise, precision and patience and the results depend on the person taking the measures. (Figure 5.)

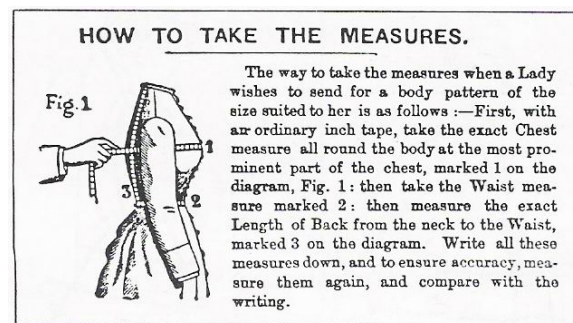


Figure 5: Showing how to take measurements, from *The London and Paris Ladies' Magazine of Fashion*, March 1879. *The Victoria and Albert Museum* [5]

One can rely on professional traditions and standards when taking body measurements in order to produce articles of clothing. MSZ EN 13402 is a European standard defining body measures for garments and prescribing measure taking procedures. For making a garment one needs to measure length, width and circumference.



### 1.3 Body scanner

As a result of technological development in the 1990s new, automated, touch-free 3D scanners were introduced to scan the shapes and measures of 3 dimensional targets. This special device called “body scanner” uses laser or white light to take pictures or finger all around the shape of a body. Based on the measured data a human figure can be digitalised. With the help of a special computer software the data will then be projected on the screen as a three-dimensional picture.

Nowadays these systems are able not only to create a 2 dimensional picture of a 3 dimensional shape but also to draw a 3 dimensional picture from 2 dimensional data. These so called 3D body scanners represent a new technology both in producing ready-to-wear clothes and in developing new products. The new softwares has made an automated measure taking possible.

The light source of a body scanner can be halogen, infrared or laser. Laser-based systems scan the body horizontally, layer by layer. Today’s body scanners are able to finger the body within 5-20 seconds, however, a person is able to stand still for a very limited time (about 1-2 seconds). Therefore the speed of data scanning is a crucial area for development in body scanning technology. (Figure 6.) The position of the scanned person (ie. standing, sitting, holding arms apart or folded next to his body) is essential when taking measures with this technology, because it affects the scanned or covered areas. In order to avoid distortion it is important that the model is wearing a tight underwear and he is standing very firm and still. [6] Due to technical development these devices have become more precise and faster but their price has gone up at the same time.

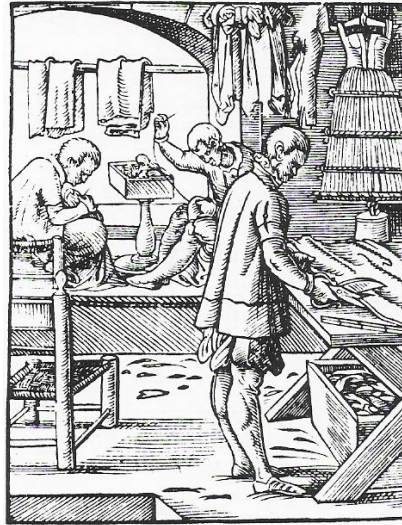


*Figure 6. 3D scanner*

## 2 CUTTING

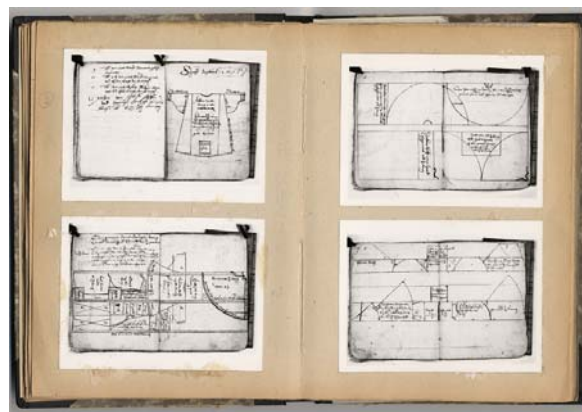
### 2.1 Process of cutting in the past

In the old times they did not need to take measurements for the cutting of garments which consisted of simple, geometrical shapes. (Certain traditional garments still do not require precise measures.) They cut simple shape parts for a garment by eyesight, based on a great deal of experience. Making more complicated cutting patterns – and, later, following fashion trends with more and more varied and special garments – required skilled and experienced masters with serious expertise. (Figure 7.)



*Figure 7. The Tailor from Ständebuch by Jost Amman and Hans Sachs, 1568. The woodcut shows a tailor's workshop in Nürnberg. [7]*

Patterns were created from the measure taking data and were drawn directly onto the fabrics. We can find such patterns in European museums. These patterns represent master tailors' practical skills, however they were kept as top secret items in the workshops. Our first written record is Henrik Niedermayer's pattern book from 1544, which is kept in the Ferdinand Museum in Innsbruck. In this book we can notice not only formal solutions for patterns but also arrangements of parts to be cut from the fabric. (Figure 8.)



*Figure 8. Pattern book by Henrik Niedermayer Henrik*

In the pattern books of guild masters we can find patterns drawn by the shape of a garment only with outlines. There are no construction lines or any other data referring to construction. They showed the outlines of the parts of a garment, sometimes with measures of a certain line. (Figure 9-10.) [8]



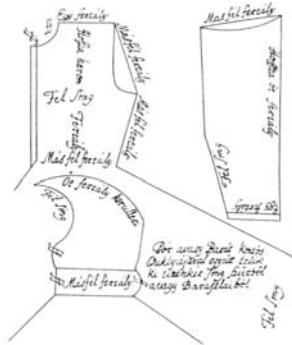


Figure 9. Pattern book from Kassa (Kosice), 1760.



Figure 10. Pattern book from Gyöngyös, 2nd half of 18th century

Tailors' trade guilds were considered to be one of the most prestigious and popular ones. We know about 213 independent tailor guilds in Hungary between the 14<sup>th</sup> and 19<sup>th</sup> century. Prices of their products were set by decrees. In the first half of 18th century garments made for order and garments for sale in the market were priced separately. Market tailors made two or three sizes of a garment and sold them at mass events. These ready-to-wear articles were easily available for customers. [9]

Development of garment shapes and the changes in fashion made tailors to constantly experiment and improve their knowledge of various body figures. All these changes resulted in the development of tailor trade. Always new constructing methods appeared as fashion trends changed. The earlier mentioned Salamon Marmorstein was the first one who examined various human body figures, including irregular features of figures. He studied features of each build with a special attention and he used his results in pattern design.

Acceleration of industrial development and permanent changes in fashion resulted in significant improvements in tailoring as well. With the spreading of book printing various professional books and periodicals became available for "everyone". Fashion magazines started to publish patterns. Masters fitted patterns of fashionable clothes to customers' sizes for their order. Around 1870s tailor workshops all over the country made men's and women's clothes following Paris and Vienna fashion trends, known to customers from magazines like *Divatszalon* (Fashion Saloon) or *Magyar Bazar* (Hungarian Bazaar).

People's need for ready-to-wear clothes was served by small manufacturers and tradesmen who normally made five or six sizes of a garment. They copied the pattern onto the fabric by drawing it around, placed a few layers of material on one another and then did the cutting by hand.

## 2.2 Tailoring today

Manual pattern making and cutting is still a widely used method both in tailored clothes making and in creating a sample article in factories.

During the technical development in manufactures the first workphase to be mechanized was cutting. Cutting of layings on top of each other into pieces and the precise cutting of parts were done with the help of various cutting machines. (Figure 11.)



*Figure 11. Cutting machines*

The appearance of computer in the second half of 20<sup>th</sup> century made a revolutionary change in the preparation of production. The more and more advanced computer-based design systems storing patterns digitally made it possible to modify, model and grade patterns or even to make a lay-out. Even today cutting is still done after the printed lay-out, by various cutting machines. (Figure 12.)



*Figure 12. Plotter*

With the further development of computer systems cutting became automatically controlled, which simplified the traditional cutting procedure. (Figure 13.) Machine manufacturers worked out new ways of cutting like jet cutting or laser ray cutting. These methods, however, did not prove to be efficient for cutting in large amount.



*Figure 13. Automatic cutter*



In the process of garment trade design the designer's concepts are realized from 2 dimensional design sketches and patterns but several efforts are aimed at further developing the designing procedure. The constantly developing 3D editing and simulation softwares provide an opportunity for "spatial design". Presenting a virtual prototype gives way to individual needs for mass production. [6]

## SUMMARY

The application of modern production preparing tools, cutting machines and up-to-date computer softwares significantly increase the efficiency of manufacturing. Manufacturers specialized in various product groups can choose from a range of high-tech solutions suitable for their purposes. In the phase of product development and in tailor workshops or designer saloons, however, traditional cutting techniques are essential and therefore are still in use.

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