

The romance of modern manufacture¹ – a brief history of embroidered embellishment

The Last Schiffli

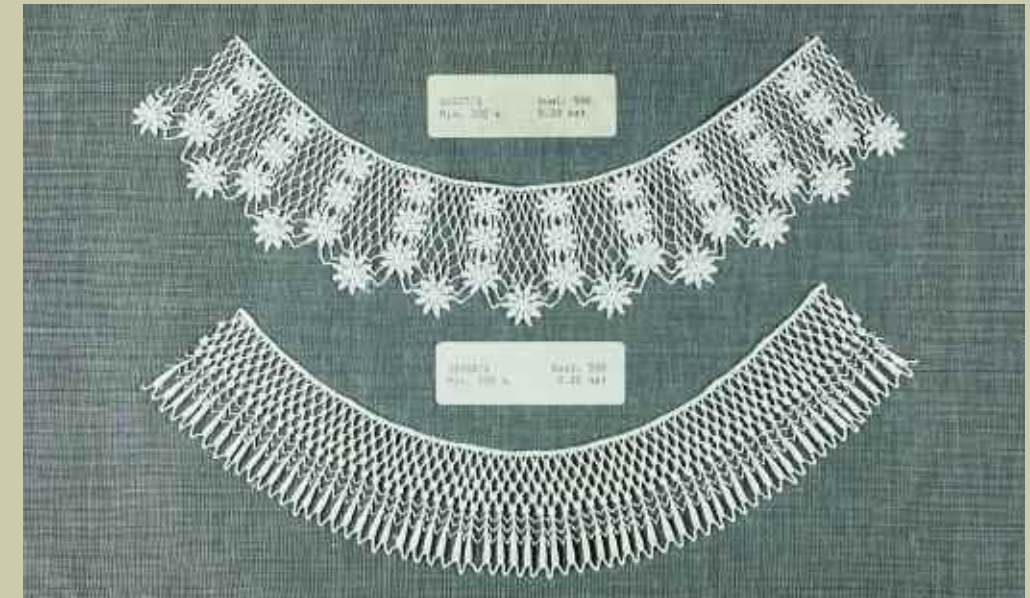
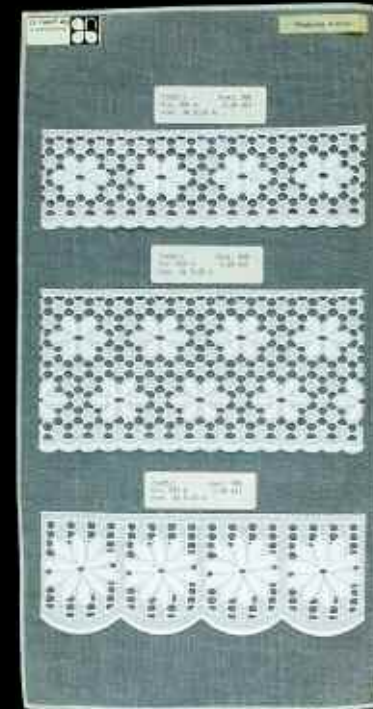
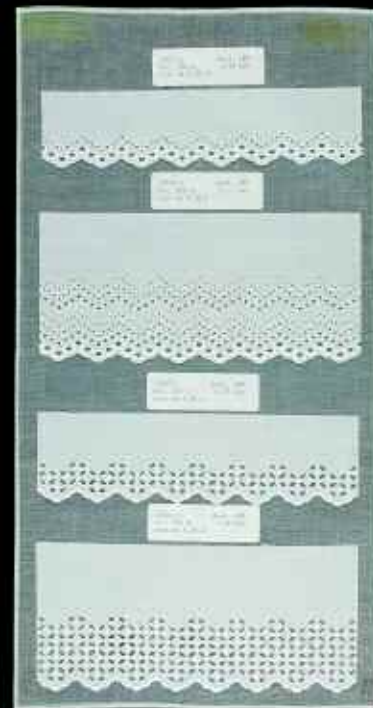
In order to understand the significance of the schiffli machine it is necessary to have an appreciation of the history of the commercial mass-production of embroidery. It is a surprisingly complex area. A vast range of different specialist machines have been utilised over the last 180 years to create embroidered embellishment on clothing and household textiles. These machines have ranged from individually controlled machines that stitch only one item at a time, such as the Cornely and the Irish, to the machines that employ a multitude of needles to literally mass-produce embroidery. The hand embroidery machine, the schiffli machine, and the multi-head machine fall into this category.

Embroidered decoration has been a feature of textiles since prehistoric times; an example dating from the 4th century BC has been found in the Ukraine. Whilst embroidery was traditionally done by hand, a machine to replicate hand stitching was invented as early as 1828, pre-dating the lockstitch sewing machine by some 20 or so years. It is intriguing that the first machine capable of embroidering a piece of cloth was invented before a satisfactory method of machine stitching two fabrics together was resolved. The hand embroidery machine² – so-called since it replicated the way hand embroidery was done – was invented in 1828 by Josué Heilmann of Mulhouse, France. Heilmann “resolved to make something new and startling, yet at the same time useful. I thought men have woven and printed textiles by machinery but no one has ever embroidered by machinery. The very words

‘machine embroidery’ are never encountered in books on textiles – all the more reason for my endeavour”.³ It seems probable that Heilmann’s mission was also fuelled by the fashion for ‘flowered muslin’, gossamer-fine webs of cloth embroidered by hand, white on white, a key component of the long flowing empire line gowns fashionable for women at the beginning of the 19th century.

The principle on which the hand embroidery machine operated differed from that of hand embroidery: rather than moving the needles across a piece of fabric, the piece of fabric moved to create the required pattern. The fabric was held vertically in a frame, its movement controlled by a pantograph, and a long row of double pointed needles, with an eye in the middle of the thread, stitched the design into the fabric. The needles passed right through the fabric, being held by two sets of pincers, one on each side of the fabric. The design to be stitched was enlarged by a factor of six. The machine was controlled by a single operative, who had to co-ordinate all of his/her limbs in a complex and precise operation. A wheel was turned forwards and backwards with the right hand to move the pincer bars containing the needles towards and away from the fabric. The feet operated mechanisms that opened and closed the pincers, thus releasing/grasping the needles. The left hand traced the enlarged design and thus moved the frame holding the fabric. And all the time, with each stitch, the length of thread left in the needles got shorter and shorter, so the distance the right hand travelled became marginally less and less.⁴ It might be imagined that the quality of work

- 1 Title taken from ‘The Romance of Modern Manufacture: a popular account of the marvels of manufacturing’ by Charles R Gibson, published in London, 1910. This book includes a chapter on embroidery mass production, ‘Embroidery done by steam-power’ that succinctly describes the mechanisms of both the hand embroidery machine and the schiffli machine. It is interesting to note that the book is almost exactly contemporaneous with the MMU schiffli machine, and thus provides an interesting contemporary account of the automation of manual labour.
- 2 Also known in the US as the ‘handloom’, and in contemporaneous sources as the ‘put-through’ or ‘nipper’.
- 3 Josué Heilmann, quoted by Patricia Wardle in ‘Machine Embroidery’ by Christine Risley, 1961.
- 4 The Appenzeller Folkskunde Museum in Stein, Eastern Switzerland, has a hand embroidery machine on which mesmerising demonstrations are periodically given.



produced on such a machine would be crude, but in fact the work created was exquisite. The extensive output of the hand embroidery machines is not always acknowledged – since the method of production resulted in work that looked identical to hand embroidery, some confusion can arise over the attribution of production method. Outputs included fine broderie anglais whitework and complex guipure fabrics, metallic threads on sheer chiffons, textured wools that mimicked woven structures; anything that was done by hand was replicated by machine.⁵ Specialist embroidery designers understood perfectly the technology of production, and could thus exploit the creative potential available.

5 The Textile Museum in St Gallen, Switzerland, has an unparalleled collection of pattern books from Swiss embroidery companies, showing the vast range of effects possible.
6 In the 1970s the punchcard system was computerised. However some schiffli manufacturers even in the 1990s were still utilising pantograph pattern control.

Previous page: Early 20th century dress trimmings
Left: Broderie anglais produced by the Naef company in 1980;
Above: Guipure lace also by the Naef company, 1980.
Although these embroideries have been produced relatively recently, they differ little from schiffli embroidery of the 19th century.

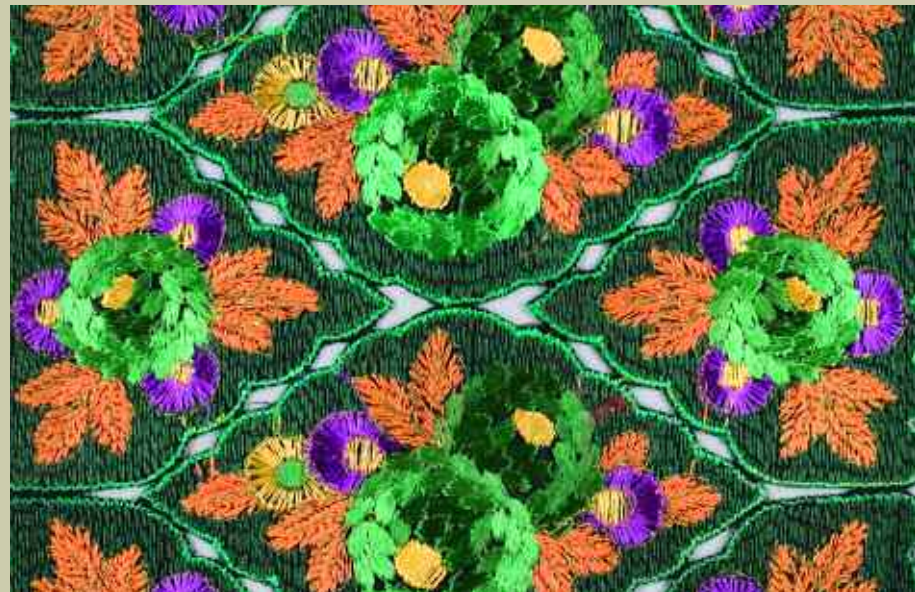
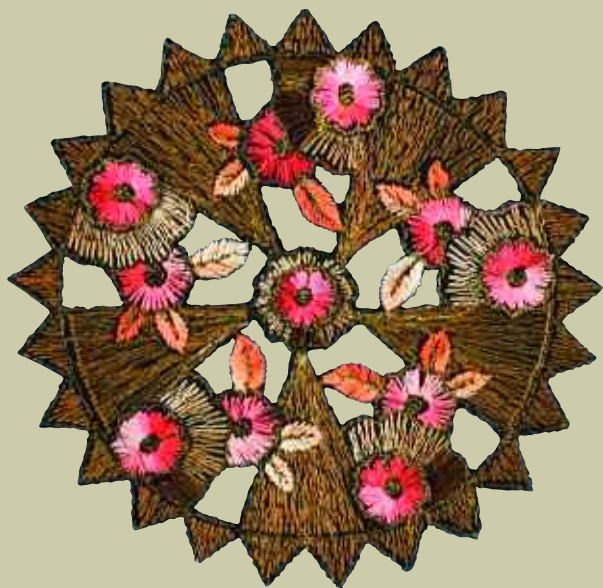
The hand embroidery machine was in widespread use throughout Europe from the 1830s – 1950s, especially in Switzerland. Appropriately, given that Manchester is the location of the last schiffli embroidery machine in the UK, the first hand embroidery machines in the UK were located in Manchester: Henry Houldsworth purchasing two machines in 1829.

After the development of the lockstitch sewing machine in the 1840s it was inevitable that the same principle – of using two continuous threads to create a line of stitching – would be applied to embroidery. The schiffli machine was invented in Switzerland in 1863 by Isaac Groebli, and in widespread use throughout Europe and America by the 1870s. It combined the basic principles of the hand embroidery machine: long rows of needles stitching into fabric stretched over a vertical frame – with the principle of the lockstitch sewing machine, utilising a row of bobbins, or shuttle threads. The schiffli machine gets its name from the boat shaped shuttles that carry the bobbin threads at the back of the machine: ‘schiffli’ means ‘little boat’ in dialect German. The largest machines are 19 metres

long, and contain 1,416 needles. Within embroidery manufacture the development of a new production method does not immediately make a previous method obsolete – use of the hand embroidery machine continued alongside the schiffli machine – many factories utilised both production methods.

Initially a pantograph controlled the schiffli machine, the same pattern control method as used on the hand embroidery machine. In the first decade of the 20th century, however, a punchcard system was developed so that designs could be replicated automatically, without the need for a pantograph operator. It was costly to adapt machines to this new operating system, so many schiffli machines continued to be operated by pantograph.⁶

The UK schiffli industry
Used extensively in the 19th and 20th centuries in the UK for the manufacture of decorative embroidery, with a strong base in Nottingham and Macclesfield, the schiffli industry is no longer indigenous to the UK. As recently as the 1990s there were still a significant number of schiffli manufacturing companies operating in the UK. However, as



with so many aspects of clothing and textile production, cheaper manufacturing costs in the Far East led to the closure of all the UK schiffli companies who were unable to compete economically with offshore production. The machine at MMU is therefore the sole remnant of what was once an important industry in the UK: it is the last working schiffli machine in the UK.

Taking up a not inconsiderable amount of workshop space, some concern has been raised in recent years as to how appropriate it is to maintain a supposedly 'obsolete' machine within an art school. *The schiffli project* was developed to highlight the significance of this unique machine both within and outside MMU, and question contemporary approaches to technology, innovation and obsolescence. Using 'mechanical drawing' as the theme, since the machine can be seen as a huge drawing machine, demonstrations and workshops were offered to staff within the faculty of Art and Design. The project grew; interesting work was being produced – it should be exhibited. As the long-term future of the machine remained uncertain, it also seemed

appropriate to document work as it was produced on the machine, thus recording the schiffli process for posterity. Thanks to the dedication of support staff within MMU, the users of the machine unwittingly secured starring roles in the DVD 'Mechanical Drawing'.

Whilst the Art and Design staff came from a variety of disciplines, it also seemed appropriate to open up the use of the machine to artists from outside MMU. With the support of an Arts Council grant this became possible.

The MMU schiffli

The schiffli machine at MMU is approximately one hundred years old. It is a Plauen machine, built by Vogtlandisher Maschinenfabrik in Plauen, Germany. As schiffli machines go, it is relatively small, with 'only' 86 needles, and a stitching area two metres wide. It was purchased in the mid 1970s from Hewetson, a large embroidery manufacturing company in Macclesfield, where it was used as a sample machine. Images are created by moving a pantograph by hand. Contemporary schiffli machines are

now computerised, and whilst this speeds up production, within an art school environment the pantograph schiffli machine provides a unique opportunity to be physically involved in the creation of the embroidered image. The design has to be drawn up six times larger than the finished embroidery; the operator traces around the design, pressing a trigger to make the needles shoot forwards to create the stitches. The slightest movement by the operator is mimicked, in miniature, by the thread on the cloth.

It is a very seductive process, there is something magical seeing an image simultaneously repeated twenty, thirty or forty times or more across a piece of cloth; and the rhythmic squeak as the machine progresses is quite hypnotic, if a little noisy. The machine looks intimidating – but is surprisingly easy to operate, it is an amazing, beautifully balanced piece of engineering: a huge mechanical drawing machine.

Above and right: Multi-coloured dress trimmings, early 20th century.





Although the potential canvas for the artists in this exhibition is relatively large – fabric two metres wide and up to two and a half metres long can be stretched into the frame – the artists have to work within certain parameters. The needles are set a fixed distance apart, and the area visible to embroider at any one time is limited to a height of about 40 centimetres. The maximum width of an image or pattern is about 13 centimetres. Colour change can only be achieved by re-threading needles, a time-consuming, backbreaking operation. The artists represented in ‘Mechanical Drawing’ have each approached the machine in a very individual way, bringing something of their own practice to the machine and challenging the usual pre-conceptions of commercial embroidery.

Hewetson

Augustus Hewetson established this company in Macclesfield in 1898 with four hand embroidery machines. Over the next few years it was gradually expanded, with the purchase of further hand embroidery machines, and schiffli machines in 1905. In 1927 automatic machines were installed and the firm claimed

to be ‘the largest manufacturer of all types of embroidery in the world’.⁷

During the two world wars Hewetson was a major supplier of badges for the Allied armed forces, embroidering fifty million badges during the Second World War. By 1958 there were about 1,000 employees on several different sites. During all this time (1898 – 1958) the company was tightly controlled by one family, the Hewetsons. There was a change in ownership in 1982 when it joined the Berisford group. Following re-structuring of the company in 1993 Hewetson ceased to operate as a schiffli manufacturing company.

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⁷ Collins L and Stevenson M, ‘Silk, Sarsenets, Satin, Steels and Stripes’, The Macclesfield Museums Trust, 1994.

Left: Multi-coloured dress trimmings, early 20th century.
Above: 1970s dress trimmings; early 20th century dress trimmings.