

Sewing and Other Methods of Leaf Attachment

[Cover to Cover: Exposing the Bookbinder's Ancient Cra](#)



Once the sections had been collated, the next step in the binding process was to sew them together. The purpose of sewing was to connect the leaves in such a way that they would be firm and yet easily opened when bound; it also provided the best means of attaching the book to its cover.

There were many different types of sewing methods. Most of them, however, required the use of common materials and equipment. These included: linen thread of a thickness appropriate to the size of the book; a needle; beeswax to facilitate the needle and thread in piercing the binding; unbleached linen tape or hemp cord; paper; a pencil and ruler, and most importantly, a sewing frame and its brass keys. Here's how the binder used these materials to complete some of the more common sewing systems:

Flexible Sewing on Raised Hemp or Linen Cords



An exact abridgment of all the statutes in force and use from the beginning of Magna Charta. Edmund Wingate et al. 1689
Flexible sewing on raised cords.

Raised cord sewing was the method most often employed until the mid 18th century. Essentially a form of 'all along' sewing, in which the thread ran up and down each section and around the sewing supports uninterrupted, it was probably the strongest and lightest of all the sewing systems. Although examples of it have been found on vellum bindings as early as the 9th century, when leather thongs were used in place of hemp cords, it was a method typically associated with leather bindings. It could be easily identified by the raised bands which divided the book's spine into compartments, at least one or two of which would later be filled with title and author information.

To sew using this method the book first needed to be 'marked up'. If a book was to be marked up for five cords, for example, a strip of paper was cut the width of the spine and about one quarter of an inch longer than the book. One eighth of an inch was then marked off the paper, the size of the book plus the overhang of the


would eventually form its cover. The length of the strip was then measured and divided by six. For the purpose of aesthetics, the space between the last band and the tail of the book was usually slightly larger, so a fraction was taken off the measurement to allow for this and the distance marked on the strip with a pencil. The head and spine of the book were then 'knocked up' or squared, the strip of paper laid against its spine, and the measurements transferred to the back of the sections using a gale and strong pencil lines. At about a quarter of an inch from either end of the spine a mark was made for the ketle stitch, the chain that would secure one section to the next.

The sewing frame, examples of which can be seen below, was then strung with five loops, known as lay cords, were hung from the cross bar and five

section below it but again to the one below that. The thread was then cut and left between the sections. Finally, the book was removed from the sewing frame. By pulling on the loose ends of the linen or hempen cord that had been hung from the lay cords, the knot was automatically unknotted and the brass key

the needle and thread and pushed it out, this time on the right simply took the thread over the cord and pushed it back inside the section on the cord's left. The thread never encircled the cords as such; it simply passed over them, leaving the majority of it visible on the inside of the sections only. Future sections were added and sewn in the same way, and linked together at head and tail by means of the ketlesitch as used in raised cord sewing.

'Flexible Not to Show' Sewing


'Flexible not to show' sewing on cords.

Virtually a cross between raised and recessed cord sewing, the 'flexible not to show' method was devised in the 19th century. It involved marking up the back of the book as in recessed cord sewing.

half an inch from both the head and tail. The position for the middle tape was centred between the two, where a pencil mark was made slightly wider than the width of the tape to be used. The final two tapes were positioned in the middle of the centre and the respective ketle stitches were marked up slightly wider than the tape width.

Setting up the sewing frame for tapes required a different set of brass keys to those used for cords, more rectangular in shape and included a straight bar over which the tape could be passed.

of tape to a length which allowed ample working space between the frame's crossbar and its bed, usually twelve

The cord was then frictioned to the brass key which, in turn, was pushed through the slot of the frame

The other end of the tape was pulled over the crossbar and secured tightly with a pin. la gh t g p

out on the left side of the next cord and the thread inserted on the right side of the section below, and so on along the length of the book. Importantly, the first and last two sections of the book were still sewn in an all along method to give added strength. The work was then removed from the frame in the manner as for flexible raised cord sewing.

Although it might appear a complicated method of sewing, once mastered its benefits were significant. For a book sewn on five cords, there would only be three stitches of thread inside each section, as opposed to six for a book sewn all along. It essentially reduced the amount of swelling in the back of the book by half.

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once they have been marked up, and before sewing. It can also be used to push holes through card

Thread Tension

Whilst sewing, it is vital to keep the tension of the thread even throughout the book. If the sewing is too loose the sections will sag; too tight and the thread will strain. Similarly, the two ketle stitches must be tightened evenly so as to avoid one end of the back of the book begins to swell too much, a loaded stick (a wooden stick loaded with lead at one end) can be used on top of the sections, between the cords or tapes, to gently tap down the paper.

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í õ š Z v š μ Op@ch@p@ture frame.

The substance used in a caoutchouc binding is often referred to as Gutta percha. Whilst both of these materials are formed primarily from the sap of trees, that's really where the similarity ends. Caoutchouc is a natural rubber which is harvested in the form of latex, mostly from the Pará rubber tree (*Hevea brasiliensis*), which is native to South America. The sticky latex is drawn out of the tree by making incisions in its bark and collecting the fluid in vessels. It is then refined into rubber. Importantly, it can also be vulcanised, that is, heated to improve its resistance and elasticity. The uncured rubber finds its way into cement in (t A ane A A (i c a s

and the tapes or fabric, whichever is used. In order to reduce the swell in the back of the book which would be caused if the staples in the various sections were all inserted in a corresponding position, the machine is so constructed that each staple forming apparatus has two or three shims whereby the staples in adjoining sections are inserted in different positions so that there appear on the back two or three times as many rows of staples as there are staples in each section."

Unfortunately, wire was prone to rust, roting both the paper and the fabric lining to which it was attached. In time, the binding would become brittle, eventually breaking down altogether. Conservation of these volumes was challenging since every single fold needed to be repaired first and then re-sewn. This meant that only the rarest and most valuable books were deemed worthy of conservation.

On display in this cabinet were the following sewing supplies:

