



MEKANOTCH

An adhesive binding method with a future, if...

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For the last two decades, library binders have utilized double fan adhesive binding to cope with ever increasing requirements to bind narrow margin materials. This process requires milling of the spine in order to expose every single sheet. The bookblock, clamped a certain distance from its spine, is either automatically oscillated back and forth over a rotating glue roller or, if done by hand, fanned as much as possible in either direction before adhesive is brushed on manually. These motions allow penetration of the adhesive like no other process used in adhesive binding bookblocks. Double fanning thus is "tipping" one page to another. Since only the adhesive holds the pages together, it makes sense that only the very best, internally plasticized, co-polymer PVA's should be used. Anything less is not worth the trouble.

Unfortunately, like any other process, limitations exist with adhesive bound library books. Coated papers may have inks which contain oily substances, not a good combination with a water-based adhesive. Heavy, cross-grained papers or dividers may split the fragile binding. The linkage with the adhesive becomes a problem. Others may have tried to adhesive bind heavy books or some volumes with formats and dimensions which then put unusual stresses onto the binding edge. In short, present library binding adhesive methods are restricted to uncoated paper stock and to books without weight and thickness. Until recently, no other adhesive binding technique could successfully cope with these problems. A notch cutting machine from Europe has changed all that.

In January of 1984, while on a sabbatical leave from my teaching duties at RIT, I had the pleasure of traveling to Germany to investigate the new Mekanotch library binding systems in several binderies. My trip was coordinated to meet Dudley A. Weiss and Jack Bendror briefly in the beautiful little town of Marburg. There, we had an opportunity to evaluate the new Mekanotch system in depth, asking a lot of questions.



Herr Diehl shows Dudley Weiss and Jack Bendror the various patterns of notches.

Notching

The new Mekanotch MN 80 was specifically designed to complement adhesive binding with new technology through a rather unique notching system that cuts in variable depths and widths in just seconds. This is different from regular spine milling used in adhesive bound books, whether in straight or double fanning applications. The dust-free notches allow for an optimum linkage between paper and the PVA adhesive.

The bookblock to be processed is simply inserted into a notching machine, underneath a pressing bar. Bookblock pressing and subsequent notching is activated with a safe, two-hand button device. The maximum bookblock thickness to be processed can be 130 mm, or 5 inches, thus allowing several bookblocks to be placed on top of each other and notched simultaneously. The notches

can be adjusted from 5 to 15 mm (3/16 to 5/8 inches) from each other, with a depth from zero to a maximum of 8mm (5/16 inch). The most common notching depth used is approximately 1 mm (1/32 inch) or slightly less. Since the machine has open sides, any size book can be fitted, even large newspapers.

The notches are made with a synchronized cutting device. Rotating knives start at the bottom of the pressed bookblock and continue in a vertical motion upwards, cutting the notches in the desired pattern and depth. Thereafter, the knife shaft returns to its starting position. There are 23 knives on a shaft, spaced 15 mm apart. A special, custom made knife shaft with a 12 mm spacing also is available. Therefore, in one sweep (4-5 seconds) 23 parallel notches are cut. Horizontal adjustments for depth are made unfortunately from the back of the machine. The operator must go around, bend down and turn the shaft manually, a factor I had to criticize. My assumption was that this most critical adjustment could be made from the operator's side. A binder may have to change the cutting depth from volume to volume, depending on the physical requirements of the book. The designer of the Mekanotch system, Herr Rosenthal, took note and intends to incorporate this feature into all future machines. Existing units can be retrofitted.

A cleverly designed side guide allows instant settings after each cycle. The bookblocks can be shifted three ways without handling or lifting the material to be processed out of the notching machine. This way, the 15 mm spaces are reduced to 5 mm even spaces. One must be very careful with the selection of the right combination of notches. Deeper notches will allow greater adhesive penetration but will reduce good openability. However, this is the first time a library binder has had the opportunity to put his skill to work by adhesive binding each volume either for strength or flexibility. In other words, the notching patterns can and should be adjusted for optimum results. I can imagine that a skilled library binder can make up a simple notching chart for



lesser skilled operators, showing which pattern is best for a given volume. With the Mekanotch binding system, there are no more excuses for adhesive binding failures! Anything can be bound with it. Our laboratory has the most unusual samples with heavy cardboard inserts, all adhesive bound utilizing the Mekanotch system. We intend to cover all possibilities in later articles.

Gluing-off

Once the bookblocks are notched with the appropriate patterns, four page endpapers, (that is, a sheet of 80# or 100# paper folded once) are placed on the front and back of the notched bookblock. The prepared bookblocks can now be used in conjunction with double fanning. However, it is here that I have my concerns regarding the binding quality. For example, if the prepared bookblocks are now just double fanned and receive a back liner in the same process, this kind of binding would be only slightly or no better than any ordinary adhesive bound book. Worse, if a fibrous paper back liner is used, the entire reputation of Mekanotch could be at stake.



The Metanotch machine is a versatile new tool for quality library binding.

A demonstration of the Mekanotch system was given by Mr. Diehl, a master

bookbinder and plant superintendent at Renois and Fuchs, a library bindery in Marburg. Herr Diehl insisted that the notched bookblocks be treated as we observed him doing it. He said anything less would result in failure!

Mr. Diehl inserted the notched bookblocks, spines downward, into large yet portable presses, one bookblock after the other with waste paper strips in between. At given intervals, depending on the paper stock, a spacer block was inserted. This allowed the bookblocks to fan slightly if pressed, when gluing-off. The books Herr Diehl used to demonstrate were of slippery, thin coated magazine paper stock, with a format of approximately 8½ x 11 inches. They were 1½ inches thick, weighing approximately six pounds each! After careful insertion, the bookblocks were pressed manually into a "log". The pressed "logs" were then easily turned 180 degrees and were then ready to be glued-off.

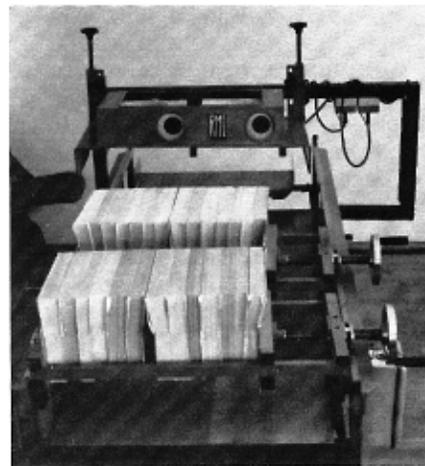
The notched spines were then saturated with a heavy coat of co-polymer PVA. The manner in which the adhesive is brushed into the notches is of much importance. Gravity will allow the adhesive to penetrate into the notches and exposed edges. Since the bookblocks are slightly pressed, no adhesive will run between the pages. Again, it is most important to let gravity and time do the penetration of the water-based cold emulsion adhesive. This is different from simply double fanning one bookblock after the other and then stacking them up for drying. If notches are cut and no waiting period observed, the adhesive would run right out of the grooves and all benefits would be lost. It is the dried, solidified PVA adhesive inside the notches that gives the bookblocks the desired strength. Library binders should have learned that lesson from cleat-laced books!

The special pressure and gluing-off device available with the Mekanotch system has an optional drying device which forces evaporation and therefore speeds up the drying process. An entire "log" of books may be taken out of the press within 20 minutes. This feature allows a continued work flow, Herr Diehl mentioned that he easily notches, presses and glues-off 400 bookblocks over one inch thick in one shift.

Trimming / Back Lining

The glued and dried bookblocks are now trimmed on all three sides according to trim size instructions. In Germany, backing is

virtually unknown. Yet, time consuming efforts are used to imitate some backing in order to control the swell. There, bookblocks are rounded only on a special Hunkeler machine. The glued bareback bookblocks are so strong that they can be excessively rounded without splitting.



Bookblocks are pressed manually into a "log."

The rounded bookblocks are then inserted into a finishing press. One by one, an additional coat of PVA is brushed over the entire spine. A heavy back lining fabric, much denser than the cotton back liner specified for LBI Standard bindings, is placed over the spine. The back liner is deliberately cut large, overlapping onto the endpapers at least one inch, and most important, exceeding the height of the trimmed bookblock. One must keep in mind that the endpapers are not reinforced as they are on an oversewn volume. If a back liner is just ¼ inch shorter than the height of the bookblock, the endpaper could easily tear in use. The back lining is mounted flush on the head and is trimmed to size when dry with a scissors.

An additional, heavy coating of a less pliable PVA adhesive is now brushed over the entire spine, sealing the back lining material permanently into the backbone. The less flexible PVA used acts as an important factor in achieving certain clamping effect, thus reducing the flexing angle of the adhesive bound volume. The lined bookblocks, with the additional adhesive coating, are now left to dry overnight, resulting in one solidified mass, a combination of notched paper, back lining fabric and strong, synthetic adhesives.



Thereafter, all procedures such as cover making and casing-in follow in a conventional manner.

In discussions during our visit, we learned that the Mekanotch system is perhaps the most popular method of affixing pages in German library binding today. Binders and librarians are equally enthusiastic about Mekanotch bindings, so much so that certain restrictions by the government had to be implemented in order to protect archival materials to be bound. The Staatsbibliothek in Germany does not allow books printed prior to 1850 to have the folded spines removed or notched!

If one reads these procedures described carefully, one must agree that this new method of affixing pages indeed has the great potential for library binding. However, it is most important to follow all steps very carefully. The selection of the notching pattern, the notching depth, the pressing and gluing-off, the placement of the glued bookblocks, with gravity allowing the penetration of adhesive, the right kind of back lining material, the mounting and sealing of the back liner and, last,



Herr Die/il, master bookbinder, demonstrates the superior strength of his Mekanotch bound books.

the importance of the adhesive quality all are factors that make this binding method successful. Any shortcuts by fast buck library binders will backfire, resulting in failures and a poor beginning for this new technology. The new Mekanotch binding method may sound time consuming, but it is a most rewarding new technology for binding library materials.

In order to get library binders acquainted with this new technique, LBI plans to have a workshop in the RIT bindery laboratory in the fall of this year. Books bound then will be tested at the Dudley A. Weiss book testing facility. Binders also will have a chance to discuss all advantages and pitfalls when utilizing this new binding method.

Finally, I would like to express my gratitude to the Barnard Foundation for covering my travel expenses to Germany. Investigating and aiding in the development of new library binding technology indeed is in the true spirit of the late Frank M. Barnard.