

Why ROUNDING & BACKING improves the quality of a Hard Cover Binding

By Jack Bendror
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Next to page attachment (i.e., sewing or adhesive binding), rounding & backing is the most critical operation in the binding process. It is this function that determines the structural integrity of the bound book block. It is analogous to the function of the familiar architectural form of the *Roman arch* which history has shown to withstand the test of time. Originally designed for the library binding market where durability is a requirement, the Mekatronics Rounding & Backing machine is now selling well in the digital printing market where short runs of *On Demand* hardcover books are growing rapidly.

The purpose of this article is to highlight the benefits of the Mekatronics Rounder & Backer, *the world's only zero-makeready Rounding and Backing machine*, which has been in successful operation in binderies worldwide for over half a century.

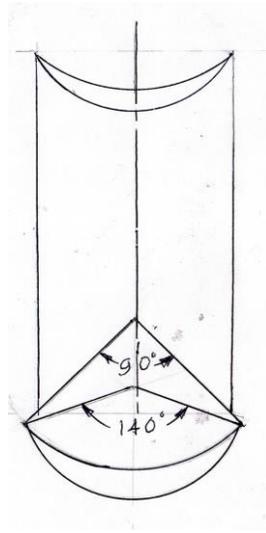
Rounding and backing has traditionally been done by a skilled bookbinder with a hammer and a special clamping device called a *Job Backer*. After sewing and gluing the signatures of a book (the pages), it is common for a swell to occur at the spine. The binder would use the hammer to shape the swell into a rounded form that is familiar to anyone who has handled a well-bound hard cover book. After "rounding", the binder creates the shoulder with the hammer by gently tapping the outer signatures or pages to distribute the "swell" over the jaws of the backing machine. The boards of the cover will fit against the shoulders of the "backed" book. When the book is pressed after casing-in, the space between the board and the shoulder will usually have a deep groove formed, called a joint, where the cover will hinge as it opens and closes. This shoulder or hinge is often referred to as "backing". The shaping of the pages during rounding and backing gives the book a stable structure that will help the book to open easily, to stay flat once opened, and to withstand the tendency for the spine to collapse inwards.

How the Mekatronics Rounding and Backing Machine works

The book is placed onto the support platform and a foot pedal is depressed. The book is clamped by a pair of rotating rollers to create the rounding as the book is delivered between a pair of jaws. The amount of protrusion below the jaws is adjustable for the desired size of *shoulder* as shown in this video.

The *backing roller* in the Mekatronics machine presses the spine over the jaw blades during the oscillating cycle which creates the joints using hydraulic power rather than a craftsman's muscle. A unique feature of our machine, *not present in any Rounder & Backer*, is that the path of the backing roller, (in this case the subtended angle between the radius from the centerline of the book to the edge of the joint) can be easily adjusted from 90° to 140° to conform to the curvature of the convex shape of the back formed by the preceding rounding operation as shown in the figure below. So it is possible to round and back a random mix of

books of different trim size, types of paper, and thickness with very quick and simple adjustments by the machine operator, producing consistent quality that a hand binder would be proud of.



Why this matters?

In a world where information is available from digital devices, the physical book must offer a quality that is instantly recognized as well as the durability that ensures long use. Rounding and backing creates the well-known shape that lovers of books expect. And the benefits of enhanced durability are a requirement for all premium products such as hard cover books. In the early days of Print on Demand books, many settled for lesser quality so that they could get the product quickly. Today one can get the product instantly via a digital device, so if the quality is not top rate, the justification for the sale is in peril. So quality is a necessity, and that means a beautifully rounded and backed hard cover book. And thanks to Mekatronics, it can be easily accomplished.

What makes a well rounded & backed book block?

The Mekatronics Rounder & Backer can process book blocks that were produced by any known method of leaf attachment. As you might expect, some binding methods allow better quality rounding and backing to be possible.

Sewn through the fold

Smyth sewn books, where the folded signatures are sewn through the fold, get the best quality. Using the Mekatronics Rounder and Backing machine it is easy to achieve rounded and backed book blocks with a nice concave front, a convex back and even shoulders.

Double-Fan binding

Double-fan adhesive (DFA) binding uses a cold emulsion PVA adhesive that creates strong page attachment and durable books. This process is used for most books that are library bound because they are proven to withstand heavy use over a long period of time. DFA binding can also be successfully rounded and backed by the Mekatronics machine.

Preheating double-fan adhesive bound books in order to obtain a better shape is quite common in Europe and with a few binders in North America.

Perfect binding with Hotmelt

The technology of hot melts has improved over the years and a variety of new EVA hot melts that expand and contract to react like a rubber-based hot melt, have been developed. Books that have been glued with standard hot melts, and subsequently rounded and backed, get the least benefit. Hot melt adhesive simply does not have the elasticity or flexibility to allow the spine to take a “new” shape. In some cases the problem known as the “ripple effect” will occur.

Perfect binding with PUR

Books that have been glued with PUR can achieve significantly better results if they are rounded and backed very soon after they come out of the binder as seen in this video. This is because the retention of the round is maximized as the PUR cures with the book in the rounded and backed state.