Notes on Making a Book
February 10, 2017

Many methods have been used over the centuries to bind pages into a book. The subject is fundamentally divided between books made up of signatures and book made up of individual sheets. Classic bookmaking uses *signatures* while "copy service" printing uses comb, spiral or perfect binding. Most books on binding concentrate on the former type.

Booklet and Classic Book

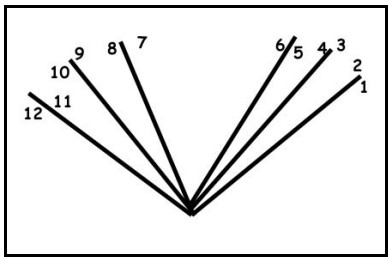

Figure 1 Diagram of a Book Signature

Here is a very brief description of classic bookmaking. For simplicity, let's imagine that three sheets of 8 ½ x 11 paper will be used to make a 12 page signature. (Figure 1) Each sheet will comprise four pages. (Note that total pages will always be a multiple of four.)

The first sheet will have p. 12 and p. 1 on one side and pp. 2 and 11 on the other. The second sheet will have pp. 3 and 10 on one side and pp. 4 and 9 on the other. The third sheet will have pp. 5 and 8 on one side and pp. 6 and 7 on the other. Once you printed these sheets you would make a *signature* by folding each one and nesting them as shown in Figure 1, so that the correct order resulted. You'd call this a booklet.

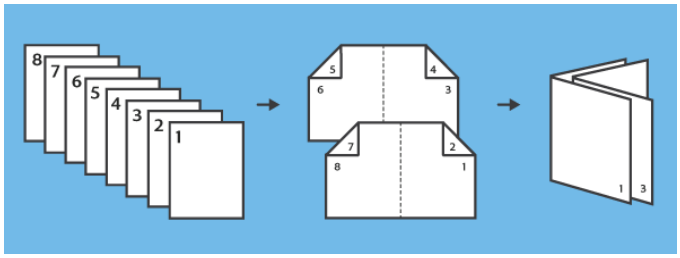

Figure 2. Adobe Booklet Printing

Multiple signatures would then comprise a book. I think that 8 sheets (32 pages) is about the maximum for a signature and even then the inside pages might need to be trimmed so that they are even.

The book would then be bound by saddle stitching the leaves of each signature together and then kettle stitching the signatures together. This is as tedious as it sounds. An excellent how-to video for the whole process, including the cover, by Christopher Ornelas of Tortuga Journals, is available at https://www.youtube.com/watch?v=VvlpDnPrG5g

Planning and laying out the type for, say, a 128 page book to be made up of four signatures would be daunting. Even getting a booklet properly formatted and printed at home is difficult. You would want software to do this for you. (See below.) Be aware that a "booklet" program has to shrink the 8½ x 11" portrait pages to fit two to a page landscape format. Fourteen point is about the smallest font that can produce readable type. Larger would be better – 18 to 22 point.

There are many instructions and videos on the web claiming to show how to make a booklet with *Wordperfect*, *Word,* or *MS Publisher*. After fruitless hours I gave up. I'm not well familiar with Word and the instructions for WP did not work for me.

Publisher is fairly clumsy to use, and not very intuitive, but it does make for stable page layouts when a document has many graphics. I might be able to use it if I gave it more time. Even the experts recommend using a third-party program to make booklets.

The easiest way by far is to use a program like *FinePrint* (http://fineprint.com/). Fineprint acts like a printer but it prints to file and then allows you to examine and manipulate the virtual print job in a variety of ways, including printing it as a booklet. (See notes below.)

Adobe *Acrobat* will do this if you choose "booklet" as a print option. Another free alternative is *Bookbinder* (bookbinder.jar) at http://quantumelephant.co.uk/bookbinder/bookbinder.html. Bookbinder is a Java program, so Java needs to be installed and enabled. It seems to work. I have not explored it much. It will arrange pages for printing in various ways that I do not yet understand.

Making a Cover.

The main distinction between a paperback book and a hardback book, as far as I can tell, is how the cover is attached to the bookblock. A paperback book has the cover glued to the spine, with or without wings to reinforce the hinges. A hardcover is not glued to the spine; rather the insides of the cover are glued to end papers that are glued to the spine.

Paperback Book

For a paperback book cover, use 65 lb or heavier paper. Print or have printed a one-piece wrap-around cover. For example, for an 8½ x 11 x ¾" bookblock, 18 x 11". Or, glue up a one-piece wrap-around cover by gluing a printed spine between the front and back covers. Make it a bit oversized and plan to trim it after it has been fitted. If you glue up the cover from smaller pieces, the amount of overlap (glue surface) between the spine piece and the covers is not critical, but should be around ½"-1". The spine piece should be glued inside the covers so that the overlap won't show when the book is closed.

The thickness (depth) of the spine after it has been bound will be reduced somewhat by being clamped and increased somewhat by being glued. The width of the book from spine to front will be increased somewhat by the mull. You may need an exact measurement of the thickness of the spine so that you can accurately fold the cover. Clamp the spine in the press or clamp it with speed clamps and measure it. For example, say that the clamped together pages make a block that is ¾" thick. The final step in binding may add an eight of an inch or so to the *width*, which is why you need to make the cover a bit oversized.

Pre-fold the spine piece or scribe a crease so that the cover will wrap neatly and tightly around the spine. The fold or scribe mark will also help to place the covers on the spine.

Optional: This is a bit more awkward but will reinforce the edges of the paper cover. Cut a piece of cloth, preferably super cloth (very coarsely woven cloth).[a] It should be as long as the spine and as wide as the spine plus about ½ - 1" Glue the cloth to the front and back covers. Do not apply glue to the spine area. Let the glue dry completely. In the last step, the cover will be glued to the spine. Unless you use end papers, you will not want the front and back covers to stick to the pages of the book block.

Hardcover book

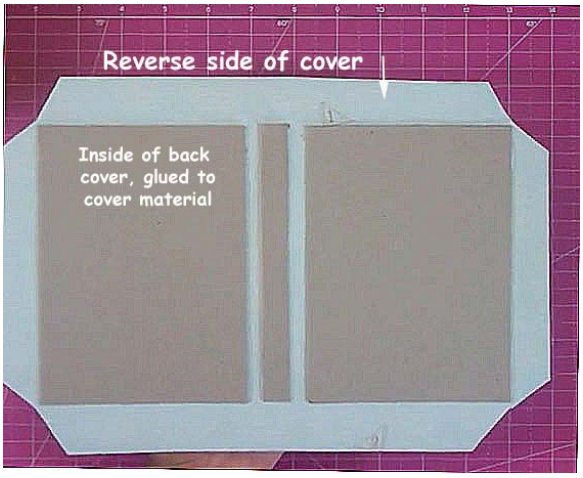

Figure 3. Hard cover boards on cover fabric

A hardcover uses three boards that are traditionally wrapped in a single piece of cloth or durable paper, with end papers glued to the insides of the covers. The covers can be "bookboard" or very heavy cardboard. The width of the covers should be the width of the bookblock minus ⅛". The height should be the height of the bookblock plus ¼". The spine is separate, and is as wide as the bookblock. The spine is separated from the covers by about [¼" + the thickness of the cover board], e.g., ¼" + ⅛" = ⅜".

Figure 3 shows the cover boards glued to the cover material with the spine in place and the corners trimmed for folding. Note the gap between the corner trim and the cover board. That should approximately equal the thickness of the cover board. Fold the cover material over the edges and glue it in place. The endsheets of the bookblock will be glued to the insides of the cover.

Perfect Binding

Perfect binding is a method for binding flat sheets by gluing the edges. (Actually, it can be used instead of kettle stitching for stapled or saddle stitched signatures as well.) You collate and square up all the pages, roughen and flatten the edge of the spine area, and then apply a flexible adhesive. Then you can attach a paper or hard cover to the spine. Paperback novels, telephone directories, and some magazines are examples of perfect binding. It can be used with publications that are several inches thick. A perfect bound book has a flat spine. If the book is thick enough, the cover can be imprinted on the spine with the name of the publication.

You'll need a heavy-duty white glue, preferably a PVA intended for bookbinding; several heavy speed clips, C clamps large enough to clamp around the signatures of the book, or a book frame/ press; fine-grit sandpaper, and a stiff-bristle paint brush. If you don't use a press you will need some clamp pads such as paint stirrer sticks.

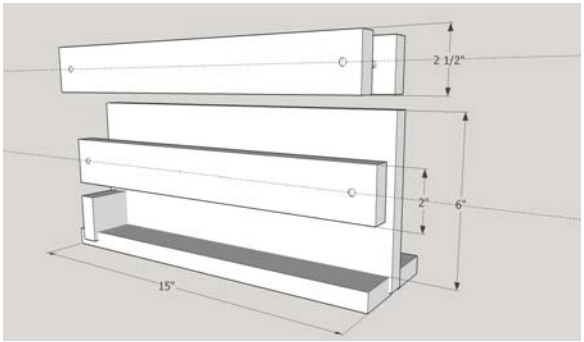

Figure 4. Book Frame/Press The holes mark 1/4-5/16" bolts with knobs or wing nuts to tighten the clamp boards against the book block. Varnish and wax the insides of the top clamp or use waxed Melamine

Prepare the Binding

1. Assemble the pages of the book in the proper order. You may want to add end pages to the pages, especially if you will be applying a hard cover. End pages should be made of durable paper, and usually are marbled or colored. For a 5¼ x

8½” size (folded letter paper) use a folded piece of letter size paper on each side of the bookblock. Jog the pages toward the spine for an even edge. A frame (Figure 4) is very useful for this. Put the pages in the frame, spine up, and vibrate it until the pages line up evenly to form the book block.

Clamp the pages together securely, preferably by tightening the lower clamp board with the knobs. You can also use speed clips or “C” clamps padded with wooden sticks. Place the top edge of the clamp board about 2-2½ " from the spine, far enough from it that you can riffle the pages to expose a millimeter or so of each sheet.

2. It will be helpful to clamp the base of the press to the workbench. Riffle the spine area of the pages in one direction. Apply a generous layer of glue to the riffled pages. Riffle the pages in the opposite direction. Apply glue. Get a thick, even coat of glue over the whole spine.

3. Apply the top clamp boards. Adjust the top of the clamp boards approximately even with the top of the book block. (The dimension shown in the figure were chosen to accommodate an 8½" wide book block.) Use waxed paper or some other kind of non-stick surface to prevent the top clamp boards from sticking to the book block. Apply additional C clamps along the spine as desired.

4. Wait for a half hour or so for the glue to dry..

5. Apply a second coat of glue to the spine. (Omit this step for a sewn binding.) Let the second coat of glue dry for 30 minutes.

6. Cut a mull[a] to fit the spine, with about 1" overhang or wings on each side. Saturate it with glue, apply to the bookblock, and let dry overnight.

7. Apply the cover.
A. For a paperback book, glue the cover to the spine.
B. For a hardback book, glue the insides of the cover to the end papers. Be sure to put waxed paper between the end papers and the bookblock to protect the edges of the bookblock from stray glue. If any glue gets on the edges of the pages it will be almost impossible to remove and will ruin the book, at this last step, by gluing the pages together. Press the book until the glue dries.

8. Trim the paperback cover to fit the book block if necessary and clean off any extra glue.

The book is now bound and covered.

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[a] The coarsely woven cloth used to reinforce the hinges of a book. It is pasted directly to the body of a book and is hidden by the spine. Also called *super* or *crash*.

Alternatives

The mull (super) reinforces the spine. It is easier to use than the following. Alternatives would be to cut shallow grooves in the spine with a sharp knife or a very fine saw. Then you can lay strong thread in the grooves in a zig-zag pattern along the spine. Start at one end, lay the thread along the spine to the first groove, then across the spine, along the spine to the next groove, and so on all the way up and back. Then glue the thread with the first (or next) coat of glue. Some people recommend drilling 1/16" holes along the spine, say every inch or two, and then sewing the spine in the same zig-zag up and back. This, while probably stronger, won't allow the book to lay flat when opened.

Notes on Using FinePrint

Figure 5 is a screenshot of FinePrint in its thumbnail display. The document sample was created and printed as single 8½ x 11" sheets with font size = 28 and printed to FinePrint. It initially had a blank page as page 1, which Publisher had inserted. I removed it in FinePrint so that the first page would print as the booklet cover. (Better to have removed it in Publisher before printing because it remained as "page 2".) FinePrint was set for *booklet* and gutters=0.375"

The first page shown in the figure will print as the cover or inside cover– the right hand side of sheet 1, side 1. Note that the binding is shown on the left side of p. 1. This is correct. The last page will print as the back cover – the left hand side of sheet 1 side 1

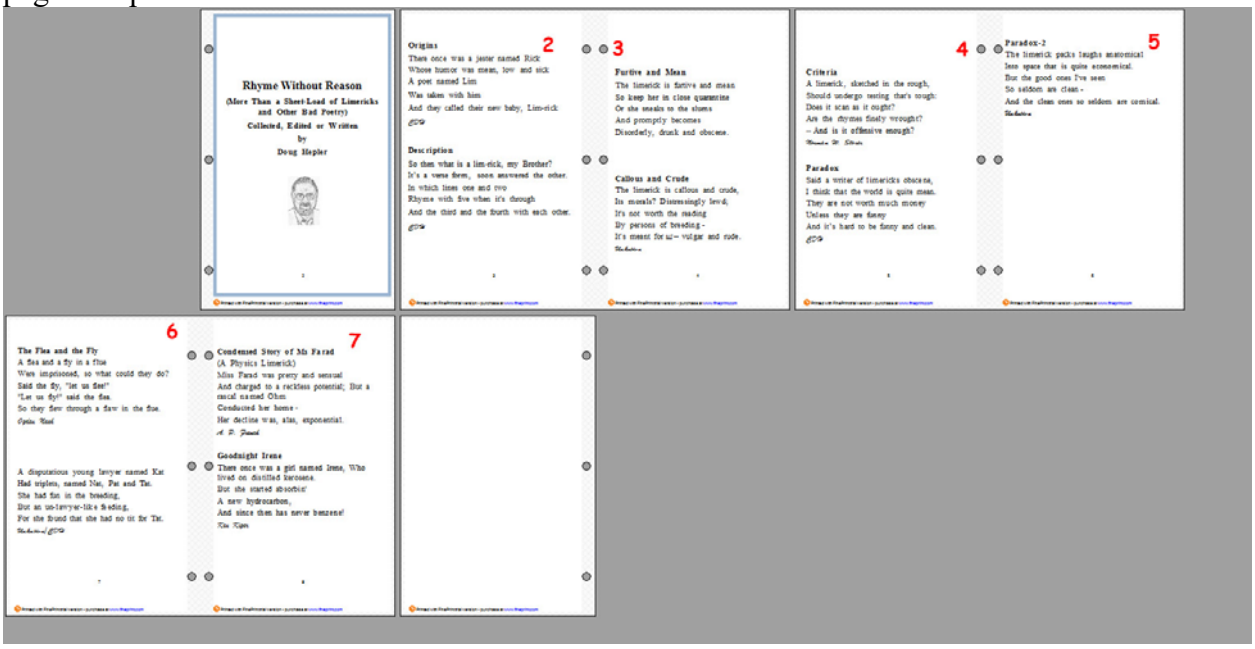

Figure 5. FinePrint Screenshot

1. The page layout shown by FinePrint before printing corresponds to the appearance of the assembled booklet. It does *not* correspond to the layout of the *sides*. The circles and shading

correctly indicate where the binding will be. The pages marked “2” and “3” will face each other in the assembled booklet but of course will not print on the same sheet. When FinePrint prints the booklet, for example, the page marked “2” will print opposite the page maked “7,” which is correct.

2. Start with a small job so that you can check order of pages, etc. Check the order of pages box under *settings* for Print in Reverse Order.

3. Use auto-duplexing to avoid mis-feeds

4. The blank sheet at the end is the “back cover” adjacent to the front cover. If I were trying to make a book out of multiple signatures, this would show up as a blank verso page, so I should make signatures correspond to chapters. FinePrint, however, allows you to subdivide a many-page job into sub-booklets (recommend about 8 sheets max)

5. FinePrint automatically saves print files, unless you turn off this feature. It also accumulates successive print jobs, so if you take two tries to get what you want, you will have both attempts, concatenated. This is a great feature if you want to combine print jobs but an unpleasant surprise if you do not.

6. FinePrint pages are editable, I would say more easily than with Acrobat.
