

Conservation Book Repair: A Training Manual

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III. BOOK REPAIR TOOLS AND TECHNIQUES

The repairs explained in this book will be easier to accomplish using the right tools and a few specific techniques.

If you already have tools and techniques that seem to work, practice each repair using the tools and techniques given in the instructions, then decide which is better. If a tool or technique does the same job and doesn't harm the book, feel free to use it.

A. BOOK REPAIR TOOLS

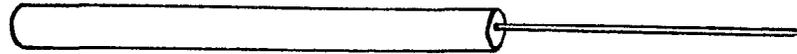


A **folder** is a tool approximately 6 - 8" long and about 1 - 1 1/2" wide. A typical folder is approximately 1/8" thick, smooth with one pointed end and one rounded end made from animal bone or plastic. Folders are used for many things such as creasing paper, smoothing down repair tissues and working cloth into a joint area. Some plastic folders are available with two round ends. When purchasing a folder, try to buy one made of bone with one rounded end and one pointed end. That tool will be much more versatile. Bone folders can also be filed to a desired shape and size while plastic folders cannot.



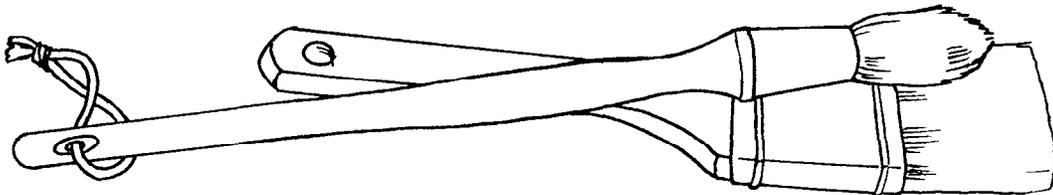
A **microspatula** is a metal tool, approximately 6 - 8" long with one rounded end and one pointed end. Use a microspatula to pick up pasted strips of Japanese repair tissue, lift book cloth or endpapers away from the book board, or apply glue or paste in a very tight area. Microspatulas are manufactured very thin and many book binders file or sand them even thinner.

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A **needle-in-a-stick** can be used to apply glue to small, tight areas, mark cutting lines or score tear lines on Japanese repair tissue.

This kind of tool can be purchased from a pottery material supply house (needle in a wooden handle) or botany material supplier (needle in a plastic handle). It can also be constructed by drilling a very small hole in the end of a wooden dowel and inserting the needle into the hole. The needle should fit tightly into the hole in the dowel. A small drop of glue on the end of the needle will help it hold better.



A good assortment of **brushes** makes repairing books much easier.

The size of the surface to be pasted or glued determines the size of the brush used, so keep a variety (thin, medium, thick) on hand. Round or flat bristle brushes be used.

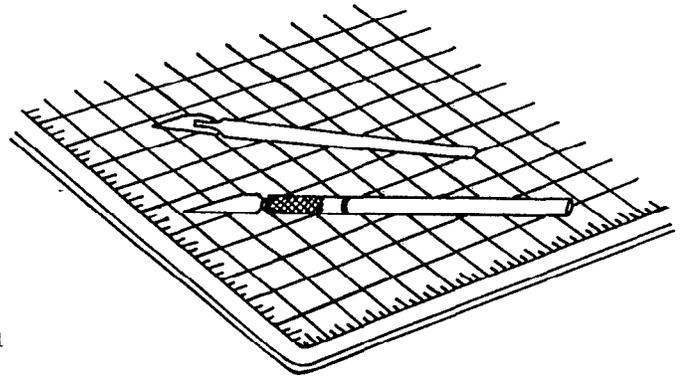
While natural bristle brushes are usually best for performing repairs, some libraries recommend using a synthetic bristle brush for PVA glue as it can be difficult to wash all the glue out of a natural bristle brush. A buildup of PVA glue can ruin a brush. Some people like to use separate brushes for paste and glue.

A brush should never be allowed to dry with the adhesive on it. Keep the brush in the adhesive or water and always wash a brush out when finished. Mild hand soap or dish washing liquid can be used to thoroughly clean brushes.

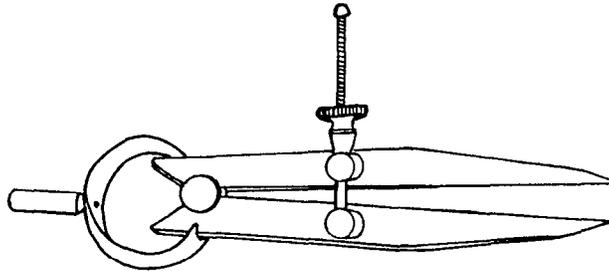
When storing a brush in water, use only enough water to cover the bristles. If the water extends above the ferrule of the brush (the metal ring around the shaft of the brush that holds the bristles in place), the wood of the shaft can expand with moisture. As the wood dries and contracts, the ferrule and the brush's bristles can loosen.

Shake out all the water from a brush before putting it in paste or glue.

A **self-healing cutting mat** and sharp **X-acto knife, scalpel or breakaway utility knife** such as Olfa Silver makes precise cutting easy and fast. It is important to always work with a sharp blade when cutting or trimming repair materials. Attempting to cut with a dull blade will usually result in a torn edge that needs even more repair.



Cutting on cardboard is not always a good idea because the knife blade can be caught in the "track" of a previous cut and ruin a repair. Self-healing cutting mats allow numerous cuts to be made without tracks forming. These mats can be purchased in various sizes from book supply sources, art stores or fabric stores.



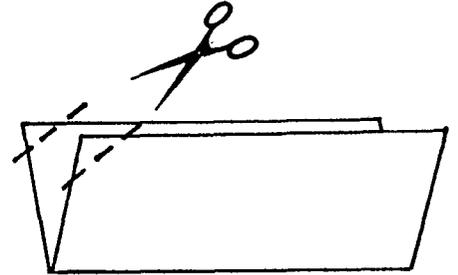
Dividers can be used to transfer and mark measurements from one place to another.

Other basic tools include sharp **scissors** and a rigid, metal **straightedge**.

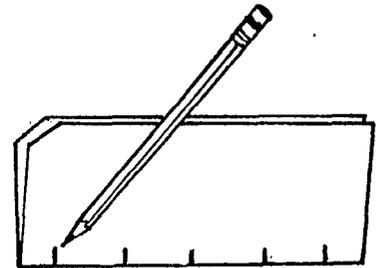
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Punching sewing holes in folded signatures can be tricky. Using a **punching jig** and a **signature punching cradle** will make the job much easier.

To construct a **punching jig**, simply fold a piece of paper in half lengthwise and clip one end diagonally. This diagonal cut marks the top of the printed page.

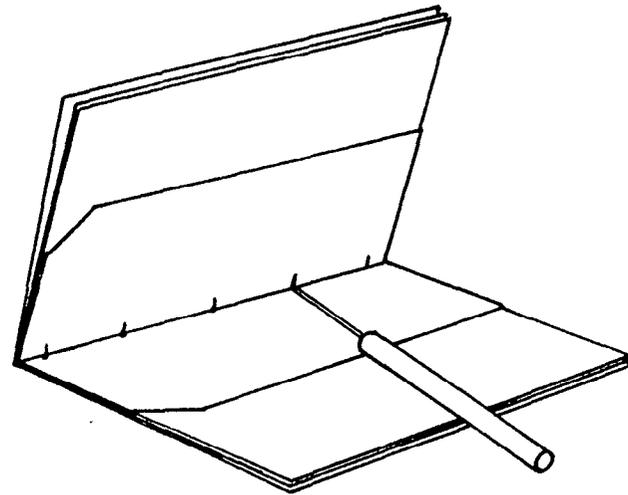


Mark the desired sewing hole stations on the outside of the fold in pencil.



Turn the jig inside out so the pencil marks are on the inside of the fold.

Place the punching jig inside the pamphlet or folded signature. The jig should be seated all the way down into the fold and lined up with the top edge of the book.

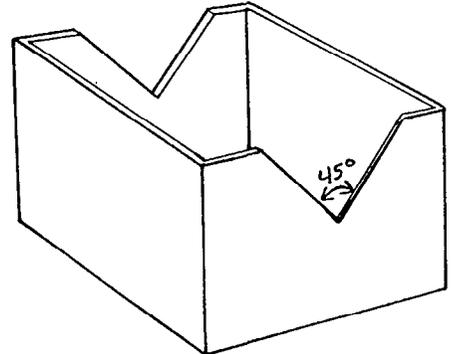


Lay the pamphlet/signature flat on the table and carefully punch holes through the fold with the needle-in-a-stick.

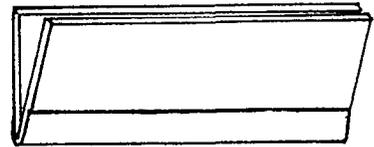
(Remember the diagonal cut on the punching jig should be at the top of the book page.)

A **signature punching cradle** helps control placement of the sewing stations and can be constructed out of thin plywood, mat board or cardboard.

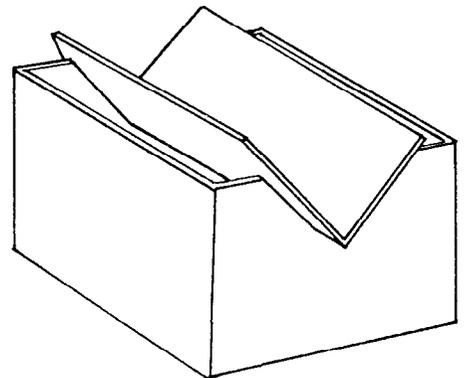
To construct a simple cradle from a cardboard box, make a 45 degree angle "V" cut in both ends of a box.



Cut two pieces of cardboard 2" longer than the length of the box and 1" wider than the length of one side of the "V" cut.

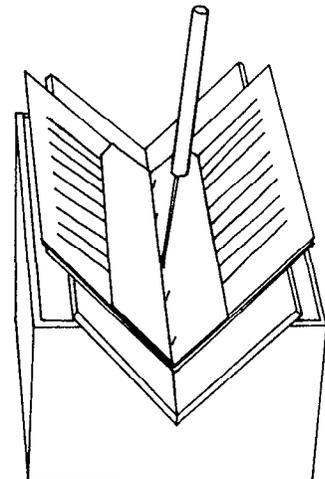


Glue a 1 1/2" strip of book cloth connecting the two pieces of cardboard along one long edge.



Glue the cardboard strips into the cut out "V" with PVA.

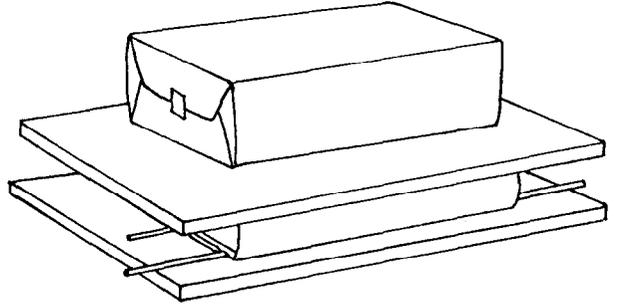
Open the material to the center of the signature and lay it in the cradle. Make sure the material is seated all the way down into the cradle. Lay a **punching jig** on top of the material and punch with a **needle-in-a-stick** (page 28).



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Paper wrapped bricks or jars filled with coins or buckshot can be used as **weights** while a repair is drying.

1/4" glass with ground edges makes a perfectly flat work or drying surface. The glass should not be larger than 18" x 18" or it can be difficult to move from one place to another. Thin pieces of plywood or Formica can also be used.



1. CARING FOR TOOLS

It is very important to keep book repair tools clean, especially tools that are used to apply paste or glue.

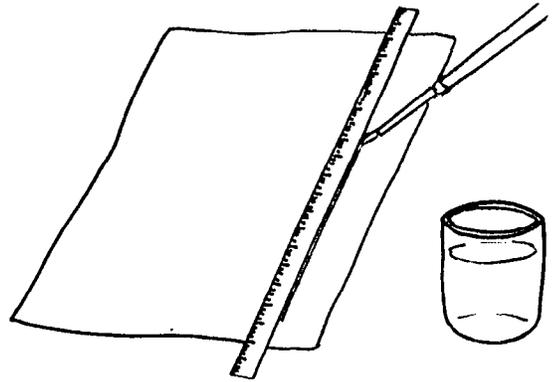
Wash folders, knives, needle-in-a-stick and brushes with warm soap and water. If adhesive is left to dry on a tool, it can build up over time and damage the tool. This is especially true for brushes.

B. BOOK REPAIR TECHNIQUES

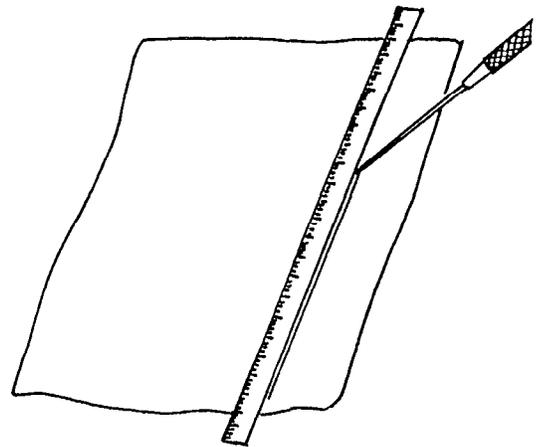
1. TEARING JAPANESE REPAIR TISSUE

Japanese repair tissue is usually torn so that the edges are feathered, not cut sharp as they would be with a knife or scissors. The feathered edge allows the repair tissue to "blend" onto the text paper. Repair tissue can be torn with a **water tear** or **needle tear**. A needle tear gives a slightly less feathered edge than a water tear.

To **water-tear** a piece of Japanese repair tissue, use a small, pointed natural bristle paint brush to draw a wet line or shape on the Japanese tissue. For a straight line, wet a piece of repair tissue against the edge of a ruler or straight edge. The water weakens the fibers of the tissue and allows it to tear along the wet line.



To **needle-tear** a piece of Japanese repair tissue, use a needle-in-a-stick (page 28) to score the surface of the Japanese tissue. The point of the needle creates a "dotted line" on the surface of the Japanese tissue to tear along.

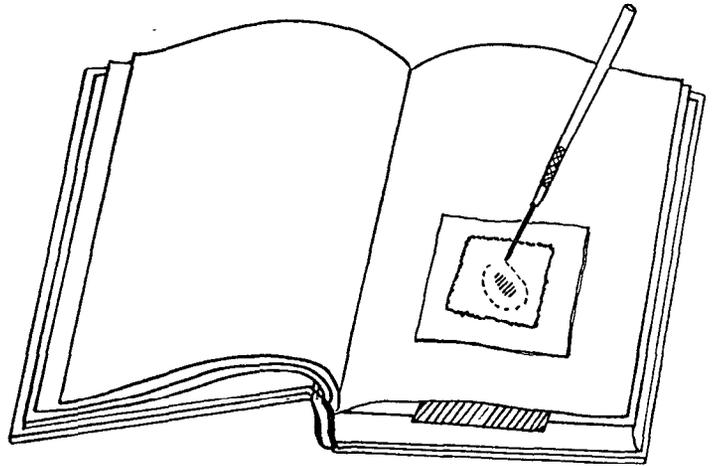


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To **tear a piece of Japanese tissue to a specific shape**, such as to repair a missing corner or mend a hole in the middle of a page, tear the tissue as follows:

Lay a piece of black mat board or paper under the missing area to make the outline of the loss more visible.

Put a piece of Mylar polyester film over the loss to protect the page from the water and needle; then lay two layers of Japanese repair tissue over the Mylar and **water tear** or **needle tear** (above) the patches to fit the loss. One patch will go on each side of the loss.



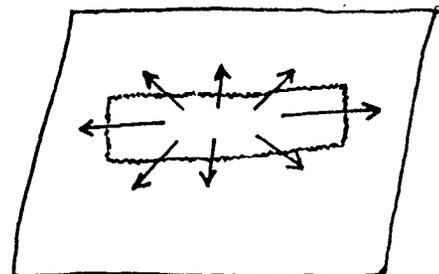
If the damaged page is not attached to the text block, it is possible to use a light table or the light from a window to see the area that needs to be patched. Put the text page on a light table or window, cover with Mylar and repair tissue. With the Mylar film protecting the page, needle or water tear the Japanese repair tissue to the desired shape.

2. APPLYING ADHESIVE TO JAPANESE TISSUE

When applying adhesive, choose a brush that matches the size of the surface. If the area is small, use a small brush; a bigger area needs a bigger brush.

A thin, even coat of adhesive makes the best bond. Too much adhesive will ooze out the edges of a repair and can stain other surfaces.

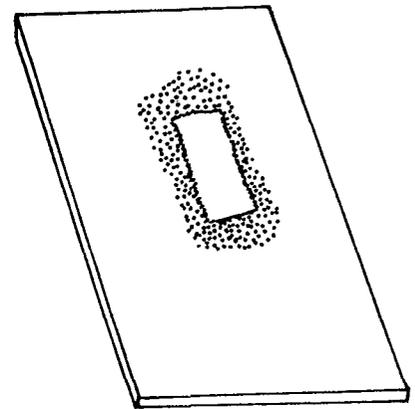
Apply paste or glue to paper or cloth by brushing from the center of the materials being glued toward the outer edges in a star burst pattern.



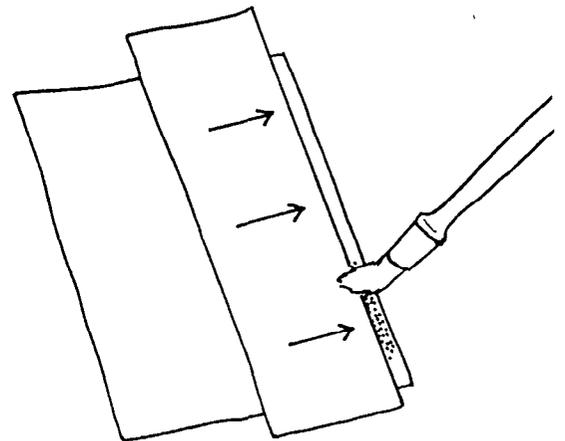
Brushing from the center out in a starburst pattern protects the edge of the paper or cloth. There might be small tears at the outer edges of a piece of paper or cloth that the brush could catch and tear or the brush might "grab" the edge of the paper and turn it back on itself, sticking the two surfaces together.

In addition to applying adhesive directly to a piece of paper, it can also be applied indirectly. This method is especially useful when working with very small pieces of paper or cloth.

Brush the adhesive onto a piece of glass or plastic then lay the paper or cloth on top of it. The paper or cloth acts as a sponge and absorbs the adhesive from below. Use the bristles of a brush or fingers to work the paste into the Japanese tissue. When Japanese repair tissue is transparent, it has soaked up all the paste it can.



Masking is another technique used to apply adhesive to paper. By using a strip of waste paper to protect most of a sheet of paper, you can apply adhesive to a very specific area in a controlled way. This is especially helpful in operations such as TIPPING-IN A PAGE.



3. Drying Repairs

Most repairs involve moisture of some kind, be it paste or glue. When moisture is introduced into paper, board or cloth, special precautions need to be taken.

A wet repair should be isolated from other pages in a book or it can adhere itself to adjacent pages and the book will not open correctly. Repairs

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to the cover of a book must also be protected until dry.

The simplest way to isolate and protect a paper repair is with a **moisture barrier**, such as wax paper, Mylar or by using a combination of a non-stick, porous material such as Hollytex or Pellon with blotter paper.

Since moisture cannot pass through a barrier such as wax paper the repair can take longer to dry.

Non-stick, porous material, such as Hollytex (purchased from book repair supply sources) and Pellon, a woven polyester material (available from fabric stores) can also be used to protect a repair. Both these materials allow moisture to pass through so repairs dry faster, but keep in mind the moisture has to go somewhere. When using porous materials, be sure to use blotter paper to absorb the moisture so it does not travel to the pages of the book.

Blotter paper is a thick unsized paper made from rag or cotton linters. Because it does not contain size (the additive to paper that makes it moisture resistant), it can absorb moisture easily. When blotters are used to absorb moisture in a book repair, they should be replaced with dry blotters periodically so the moisture of the blotter will not remain in the book.

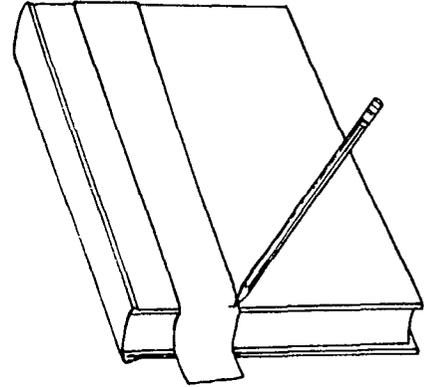
Repairs must always dry on a smooth surface under weight so that they do not buckle and curl. 1/4" glass with ground edges or pieces of plywood covered with Formica can be used to create a smooth surface anywhere. Glass or plywood can be stacked so that several repairs take up very little space. Paper wrapped bricks, jars filled with coins or buckshot can be used on top of the glass for weight.

4. MEASURING BOOKS

Measuring books accurately can be a challenge since books are not always square or flat. It's standard practice in book repair to take most repair measurements with a piece of scratch paper rather than a ruler.

Measuring the Height of a Book

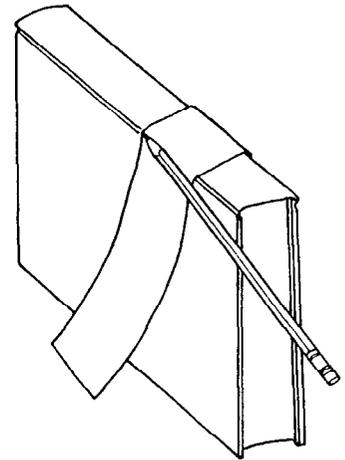
Lay the scratch paper in position and mark one or both ends of the measurement. Add direction arrows to indicate where the measurement starts and stops.



Measuring the Spine Width

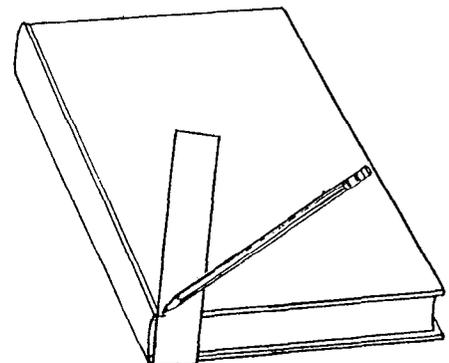
The spine can be measured in two ways.

Measure actual distance across the spine from shoulder to shoulder.



Measure the actual thickness of the spine by laying the book flat on the table and measuring vertically across the spine.

Be sure to measure the thickest part of the book. It might be the spine, the fore edge or part way inbetween.



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With the measurements on paper, the exact measurement can be transferred to paper or cloth as often as necessary. Label each measurement so as not be confused later.

Sometimes it is easier and faster to **mark a cutting line with a needle point** instead of a pencil. Use the needle-on-a-stick to mark a measurement by slightly piercing the paper, rather than marking it with a pencil.

Dividers (page 29) can be used to mark and transfer measurements from one place to another.